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NOTICES TO CORRESPONDENTS.

We have been obliged to hold over several Original Communications, Reviews, and Clinical Records.

Authors of Communications are requested to write the prescriptions in their papers, in full, and in English.

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FEBRUARY 1, 1867.

PART I.

ORIGINAL COMMUNICATIONS.

Art. I.—*Contributions to Operative Surgery. Part I. :—Operations about the Face.* By Maurice Henry Collis, M.B. Univ. Dub.; F.R.C.S.I.; Surgeon to the Meath Hospital and County Dublin Infirmary ; Member of Council of the Surgical Society of Ireland, and of the Pathological Society of Dublin ; Sometime Examiner in Surgery to the Queen's University in Ireland, and Member of Council of the Royal College of Surgeons in Ireland, &c.

(*Continued from Vol. XLII., p.* 345.)

In a standard work on surgical practice, published four years ago, the removal of the tongue is condemned in the following terms:—
"The result of ablation of the entire tongue may easily be imagined. So cruel a procedure could hardly have any other than a fatal termination ; death occurring, if not from shock and hemorrhage, from œdema of the glottis, pneumonia, erysipelas, or pyemia. As to any ultimate or even temporary good it might produce it is difficult to perceive it. There is a possibility, it is true, that the patient's life might be prolonged for a few days, nay, perhaps, a few weeks or even months; but this would hardly compensate him

for so terrible an ordeal." [a]   If the writer of the above sweeping
condemnation were now to reconsider his verdict, with a full
knowledge of what has been achieved in this direction, he should,
perforce, modify his opinion not a little.

The operation cannot now be called cruel; in fact the idea of
cruelty in connexion with it is a singular example of the force of
old associations.   Of itself the operation is milder than multitudes
of others which are daily resorted to; especially as all the otherwise
painful stages can be gone through under chloroform.   In ancient
times of semi-barbarism mutilation by ablation of the tongue was a
terrible form of punishment.   In most bodily tortures it was still
permitted to the sufferer to give vent to his misery in cries and
exclamations of distress ; whereas in this no such pitiful solace
was left the victim—lacerated and bleeding, he was popularly
supposed to be incapable of uttering a sound; and, as silent agony
is ever considered most intense, this punishment came to be viewed
as one of the severest which malice could devise and cruelty inflict.
To the traditional remembrance of these times of lawless violence
we are indebted for the horror with which many surgeons shrink
from an operation not specially severe in itself, and in certain cases
most merciful in its results.

Ablation of the tongue will be undertaken almost exclusively
for epithelioma.   I use this term advisedly, for of the existence
of scirrhus or encephaloid of the tongue we have no certainty.   I
have never met with a case of what is commonly called cancer of
the tongue which did not commence on the surface.   A primary
cancerous infiltration unconnected with and unpreceded by ulcera-
tion must be very rare.

The description of such a case, as far as my reading goes, is not
to be found ; nor have I ever met with a museum or *post mortem*
specimen of it.   Errors of diagnosis have, no doubt, caused syphilitic
hardening to be mistaken for cancer, but even in these a sore on the
surface is mostly, if not always, found.   Now, epithelioma of the
tongue is rapid in its progress, as a rule, owing to the favouring
moisture of the mouth and vascularity of the tongue.   Once it has
reached its third stage (of infiltration) the pregnant germs spread
themselves with fatal rapidity through the tissues, and in a brief
space they pervade the organ in its entire extent.   Not only do
they cross from one side of the tongue to the other, but they spread

[a] Gross' System of Surgery.   Philadelphia : 1862.   Vol. ii., p. 555.

even more eagerly along the central raphe, where at the line of junction of its two halves the tongue possesses a layer of fine vascular and absorbent tissue, the most favourable nidus possible for the propagation of this disease. Hence it comes that partial removal of the tongue, be it ever so free, is apt to be ineffectual as a means of permanently eradicating the disease. All that is hard may seem removed, and yet enough may be left, unfelt, in this mesial line to perpetuate the mischief. In a few months, or even less, it breaks out afresh, or appears insidiously in the submental or submaxillary region, and the case becomes hopeless. The opinion is daily gaining ground with those who have operated on the tongue that complete removal is a better and more merciful operation than partial, unless in peculiar cases. The benefits of removal of the tongue are not, however, to be measured by the cases which remain free from permanent relapse. These as yet are but few, for no long time has elapsed since the operation came to be considered feasible, and still less, since it became simplified and safe. Independent, however, of complete immunity from relapse, other important advantages accrue. Relief from great distress, and often from extreme pain, greater ability to breathe and swallow, diminution or total cessation of salivary or purulent discharges—offensive and wearing to the patient; finally, strange to say, decided improvement in articulation. These are some of the valuable results, short of cure, which follow the removal of the tongue when affected with epithelioma. Rescue from imminent starvation and great increase of comfort, even for a few months, are results not to be despised, where they can be obtained at an easy rate; and there are ample materials to prove that relief from pain alone, not to speak of the diminished drain on the system, and restored power to eat, are sufficient to ensure a comparatively longer life. For these reasons the removal of the tongue has come to be considered not only a feasible, but what is more important, a justifiable operation; and although but few surgeons have as yet adopted it, the feeling of many is in favour of giving it a more extended trial. My personal experience in the matter is not worth naming as yet. I have operated, one way or another, in four cases, and the results are sufficient to justify the repetition of the operation in similar cases.

Several methods of operating have been practised for removal of the tongue, in whole or in part. The depth at which the root of the tongue lies, its broad attachment to the os hyoides, its tapering form, and the difficulty of seizing it, the still greater difficulty of

passing a ligature round it (especially when distorted by disease), so that the ligature shall not slip—all these combine to render removal of the organ wonderfully embarrassing. Hence the ingenuity of surgeons has been exerted to overcome these obstacles, and the difference of the methods suggested is somewhat remarkable. A short *resumé* of the principal operations may not be out of place, inasmuch as the surgeon of large experience in these cases will have at one time to select one and again another, as most suitable.

Mr. Syme's method is entitled to precedence of notice, both for his eminent position and because of its intrinsic importance. It is a severe and serious operation, and will only be required where the disease extends far back and deeply into the base and root of the tongue—even if then. Mr. Syme did not administer chloroform in his cases, but there seems no reason against its use. I have given it when operating after his method, and in many other surgical proceedings about the mouth and fauces, and I never found any inconvenience in its use; the blood is as easily removed as in a state of consciousness; the patient is able to breathe with perfect freedom, and I need hardly say the operator is much more at his ease. Premising, then, that the patient may be chloroformed, I shall take the description of Mr. Syme's operation from his paper in *The Lancet* of February 4, 1865:—

" Having extracted one of the front incisors, I cut through the middle of the lip, and continued the incision down to the os hyoides; then sawed through the jaw in the same line, and insinuating my finger under the tongue as a guide to the knife, divided the mucous lining of the mouth, together with the attachment of the genio-hyoglossi; while the two halves of the bone were held apart I dissected backwards, and cut through the hyoglossi, along with the mucous membrane covering them, so as to allow the tongue to be pulled forward, and bring into view the situation of the lingual arteries, which were cut and tied, first on one side and then on the other. The process might now have been at once completed had I not feared that the epiglottis might be complicated in the disease (which extended beyond the reach of my finger), and thus suffer injury from the use of the knife, if used without a guide. I therefore cut away about two-thirds of the tongue; and then, being able to reach the os hyoides with my finger, I retained it there while the remaining attachments were divided by the knife in my right hand, close to the bone. Some small arterial branches having been tied,

the edges of the wound were brought together, and retained by silver sutures, except at the lowest part, where the ligatures were allowed to maintain a drain for the discharge of fluids from the cavity."

In Mr. Syme's earlier operation, two in number, death ensued from inflammation of the lungs. This was attributed by him to irritation propagated from the larynx, and led him to modify the operation as originally performed by him. The above description gives, I believe, his latest published account of this mode of operating. In it the os hyoides is not altogether deprived of its muscular supports, the genio-hyoid and mylo-hyoid muscles being left untouched; hence the unrestrained admission of cold air into the lungs is checked, and the larynx is supported. The result was that Mr. Syme's third case recovered. A fourth case upon which he subsequently operated did not, however, end so fortunately, the woman dying of inflammation of the lungs or pyemia.

In Mr. Syme's third case, operated on two years ago, the disease has not returned. " The patient, after recovering from the operation, and while travelling in the highlands, had dined at *table d'hôtes*, and entered into conversation without betraying the deficiency under which he laboured; he could swallow fluids and finely-divided food as well as ever, and could masticate solid substances, although a difficulty was sometimes experienced from their getting into awkward parts of the mouth. In ordinary speech his words were wonderfully clear and distinct, and he could sing without difficulty."

He writes, on December 25th, 1866 :—" I am as well as I ever was in my life; in my own opinion I continue to improve in my articulation, and in this opinion I am borne out by many; it is a common remark, when I meet a friend, after not seeing him some time, for him to say, how much you have improved in speaking. I can also say that I have improved much in mastication, and can now enjoy my food better than I have done for some two and a-half years, or more, for whereas I used to eat with pain, I now eat with pleasure."

This result of a case that was in an apparently hopeless state prior to operation is most encouraging.

I have performed Mr. Syme's operation once, for removal of half the tongue. The case is given in the former part of this paper. Should I have occasion again to resort to it, I should adopt a modification of it suggested by Sedillot. It consists in dividing the

bone in a zigzag or notched manner, so that there may be less difficulty in keeping the edges in apposition.   This is a valuable hint, as all surgeons will know who have divided the lower jaw for any cause.   It is a matter of immense difficulty to retain the edges in immovable contact if they are sawn through smoothly, whereas if their edges are serrated ever so slightly, this difficulty diminishes. By using a narrow-bladed saw, and inclining it a little to the right, until we go half way down through the bone, and then turning it slightly to the left as we complete the section, a sufficient irregularity will be obtained, and we shall find it easy to keep the edges in contact by tying the teeth together with a fine wire, and by the external dressings, without being obliged to bore holes in the bones and tie them together with wire.

Regnoli, of Pavia, made a semilunar incision along the under part of the chin, reaching back almost to the angle of the jaw at either side.   This incision extended through the integuments and muscles, and was deepened until the mouth was laid open, when the tongue was seized and drawn through the aperture.   If it were too large to admit of this, a vertical incision should be made in the median line down to the os hyoides.   The tongue can then be removed either by knife or ecraseur; or a strong ligature may be tightly tied round it, at its base, prior to its removal by the knife, when the vessels can be picked up seriatim, and tied at leisure— the provisional ligature being then removed.   This operation, very admirable on the dead subject, or when the tongue is of natural dimensions, would become difficult and inconvenient in cases of extensive disease.   It is not free from the subsequent dangers of purulent infiltration and pyemia.   I do not know if it have been performed on the living.

In the year 1839, Mr. James Arnott performed an operation by which he was enabled to encircle the root of the tongue with ligatures.   He only removed a portion of the organ, but by his operation the entire might be included in the loops of ligatures or ecraseurs.   He made a short incision ($1\frac{1}{2}$ inch) in the mesial line, from the os hyoides forwards towards the chin; rooting with the handle of the knife between the muscles he made a space for the finger.   Along the finger he passed a strong Liston's needle, and drawing the tongue forward by a tenaculum, he pushed the point of the needle backwards behind the diseased parts, and in front of the epiglottis.   The loop of the ligature was caught (not an easy task), drawn forwards, and divided; one half was then, by means of

a curved needle, brought round the root of the tongue, and then out at the wound in the neck. The other half could, in like manner, be passed round the other portion of the root, and the entire tongue be cut off from its basal attachments. Any remaining sublingual attachments could be snipped by scissors or divided by a wire ecraseur.

In Mr. Arnott's case ligatures were used, and it required seventeen days to complete the separation. This shows forcibly the value of *ecrasement lineaire,* by which the same end is accomplished in the same number of minutes, and the long dangers of putrid absorption are avoided.

Mr. Arnott may fairly claim the parentage of many of the more modern improvements, of which I shall now proceed to give some account.

To Mr. Nunneley, of Leeds, I think, we are indebted for proving that the greater part of the tongue may be removed by ligature or ecraseur, through an incision which scarcely goes beyond a puncture. His operation as at present performed, I take from his paper read before the British Medical Association, at Chester, and published in the Association Journal:—

" I take a sharp-pointed curved blade, about four inches long, and of just sufficient thickness and breadth to carry the wire-rope of the ecraseur. This rope I have made somewhat thicker than those ordinarily supplied by Messrs. Weiss, with Hick's instrument; and I always have a second in reserve in case the first one should give way.[a] The middle of the rope should be attached by a piece of string to an eye made in its broad end. The patient reclining on his back in a semi-recumbent position, this blade is plunged exactly in the median line, between the base of the jaw and the os hyoides, but somewhat nearer to the latter than to the former, into the mouth, and brought up at the frenum linguæ, and so out of the mouth, the wire rope following. A good sized loop of the rope

"[a] A certain amount of strength is required, or the rope will break from the resistance of the tongue. While on the one hand it must not be too thick to increase this resistance to too great a degree, so on the other it must not be too thin, or it will act too much as a cutting instrument, and thus give rise to a danger of hemorrhage, to avoid which alone it is employed. I am by no means sure that a chain made of small hexagonal pieces jointed together in alternately opposite directions would not be an improvement. It would make a chain equally flexible in all directions, and be somewhat serrated, by which it would be easily introduced, and when fixed easily cut its way through the parts. One of these chains I am now having made."

must be drawn through, and the needle cut off. The rope must now be carried well back and spread over the base of the tongue, the tip of which being then drawn through the loop, is seized with Luer's tongue-forceps, and pulled forcibly outwards and somewhat upwards. Two or three long and strong hare-lip pins, somewhat curved towards their points, should next be carefully thrust from the under side of the anterior attachment of the tongue, through its substance, and brought out on its upper surface as near to the base as possible. One of these pins should pass on each side; and if a third be used, it should traverse the median line. Their points should just appear on the upper surface, and over them the rope should be carried. They will thus serve to prevent its slipping forward when it begins to be tightened, as it might otherwise do. They are not absolutely necessary, but I think are useful, and give rise to very little pain; besides which they serve to indicate the exact portion which has to be removed. Of course, the larger this is, the more carefully must the pins be carried well back. The screw of the instrument should now be turned so as to gently fix the wire, that it may not move from the line in which it is intended to cut.

" Hitherto very little pain has been inflicted, and the voluntary efforts of the patient have been useful in facilitating the proceedings; but at this stage he should be put fully under the influence of an anesthetic so that he may not feel, and the screw of the ecraseur be steadily, but very deliberately, turned, the tongue being forcibly extended. It speedily becomes strangulated, and is cut off."

Mr. Nunneley adds, in a letter to myself, that he has operated in six cases, and that all have recovered from the operation without a bad symptom, except one who had diffuse inflammation of the lungs, from which he recovered after a few days; Mr. Nunneley attributed this attack rather to the mode in which the operation was performed, chiefly by ligature, than to any inevitable sequence on removal of the tongue. The small submental wound healed in all by the first intention. Of the results it is satisfactory to learn that one man remained free from relapse for three years, and then died from hereditary phthisis; two died from the development of the disease external to the mouth, and in the abdominal viscera; the other three have been too recently operated on to judge of the amount of permanent benefit. From each and all, however, the lesson can be

drawn that the immediate dangers of Mr. Nunneley's operation are but small, and that for removal of the greater part of the tongue it is an effective proceeding. I am not so satisfied of its being the most efficient operation for removal of disease extending far back or deep into the tongue. It will be seen by his description that the needle comes out at the frenum linguæ, the loop of wire is brought from that back over the tongue, and an oblique section is then made of the tongue. No thought seems to be taken of the sub-lingual attachments to the jaw which form no inconsiderable portion of the tongue, and which are very often the seat of some infiltration. Certainly, in Mr. Nunneley's first case, there was a complete removal of the tongue, but the steps of the operation were different, owing to the chain of the ecraseur breaking, and the necessary subtitution of ligature, and the slow process of sloughing. Nor do I see very well what is gained by the submental puncture. If the needles are first fixed in position, the chain, or rope, can be fastened with just as little difficulty from the mouth, without this preliminary puncture; although under no circumstances is this manœuvre very easy of performance. Still it can be done without this puncture, if we use Liston's fixed needles, either straight or curved. The handles of these needles enable us to pass them exactly where we wish; and if we select them with large curves, and strong, they will include most of the tongue, and even of the sub-lingual attach-ments, and they will guide the ecraseur to the deeper parts of the roots, far back. However, to Mr. Nunneley is due the credit of reducing the cutting operation to a minimum; and, in certain cases, his method may be found the most suitable.

Mr. Paget has operated in a manner which seems to me better than Mr. Nunneley's. He avoids the submental puncture, substi-stuting for it the division of the sub-lingual attachments by the knife. The following description of his operation is taken from *The Medical Times and Gazette* for Feb. 10, 1866. The man having been put under chloroform, his " mouth was drawn open, and firmly fixed so, and the tongue was drawn forward. To facili-tate this latter step the mucous membrane and the soft parts on the floor of the mouth, including the attachment of the genio-hyo-glossi muscles to the inner side of the symphisis, were cut through close to the bone. The tongue was thus in great measure released from its anterior and inferior attachments, and could readily be drawn forward, so that the wire of an ecraseur was, without diffi-culty, passed around its root, including the entire organ to its

connexions with the larynx.   The wire was tightened by degrees,
and there was some free but not dangerous bleeding when the mass
was detached.

" The man's recovery was uninterrupted and very rapid; indeed,
he regained his power of swallowing in so short a time that he soon
ceased to require special attention in feeding, and before the end of
a week he could make himself intelligible by imperfect speech, so
much so that it would have been hard, without actual inspection, to
have believed that the entire tongue had been removed."

Mr. Paget writes me that the man returned to his work, that of
a butcher, in three weeks, and was active in it for rather more than
a year.   Then he died with cancer in the sub-maxillary lymphatics.

A second patient, upon whom he operated early in January,
1866, similarly recovered, and has, as yet, had no return of the
disease.

He has operated lately in a third case; and this patient, equally
with the others, recovered without a bad symptom.   Mr. Paget's
observations upon the operation are of much value, and I shall
readily be pardoned for quoting them:—

" In remarking upon the operation, Mr. Paget said he believed
that what he had just done was suitable in the very great majority
of cases in which it was necessary to remove the tongue for
cancerous disease.   Two points, however, must be attended to
in performing it.   (1.) The attachments of the tongue to the jaw,
both in front, where there were the genio-hyo-glossi muscles, and
at the side, where it was connected by the mucous membrane, must
be thoroughly divided, so that the organ could be well drawn for-
ward; and (2) care must be taken that the tongue was divided
perpendicularly through its thickness; unless there was a definite
provision to prevent it, the section would pass obliquely from
behind, downwards and forwards, and thus parts that had better be
removed might be left.   An efficient plan was to transfix the
tongue perpendicularly with stout needles at the part at which the
division was to be made, and to place the ecraseur-wire behind
these, so that it was made to cut vertically.   There might, doubt-
less, occasionally be found cases in which the disease was situated
so near the hyoid bone that it would be advisable to perform the
larger operation recommended by Mr. Syme.   Nevertheless the
ecraseur operation allowed of complete removal of the sides and
upper part of the tongue, and was, therefore, appropriate in the

greater number of cases. The operation, besides, was attended with scarcely any risk to life."

The following is an extract from a clinical lecture lately given, on the subject of cancer of the tongue, by Mr. Paget:—

" The motive to operate here, as in other cases, is either to prolong life, or, without shortening, to comfort what remains. For the first there is, I believe, some advantage—not a great prolongation of life, yet enough to justify an operation which is attended with very little suffering or risk. But the chief motive is in the hope of comfort; and the comfort that may be gained is, in many cases, so great as to justify a greater risk of life than is incurred in any of the ordinary operations for the removal of cancer of the tongue. The risk is really very small. I have not had a fatal case, or witnessed one—there are few of even the minor operations of which I could say so much—and the comfort given is that the patient is delivered, for the time, from all the misery of one of the most distressing and disabling conditions of disease, and, till the cancerous growth is renewed, may enjoy complete health, and do all his work. Doubtless the disease will return after operation, but it is as unreasonable to refuse a painless operation, and one free from risk of life, because the disease will return at some time soon after it, as it would be to refuse a course of medicine because it gives only temporary relief. When a man has only, suppose, two or three years to live, it is no small advantage if at least half the time can be spent in comfort rather than in misery, and in profitable work rather than in painful idleness. Looking back on the many cases of cancer of the tongue that I have had to do with, I should be disposed to say that there is no organ on which operations for cancer are more justly performed, or are more to be urged, even in extreme cases."

His latest expression of the value of the operation is as follows:—
" I have not yet seen anything to make me believe that the operation will materially lengthen life; but being, as I believe, attended with very little risk, it is justified by the great comfort which it gives. It releases patients from the greater part of the misery belonging to one of the most miserable diseases of which a man can die. And this it does, not only at little risk, but with very slight pain, and so partial a loss of speech that the defect is scarcely noticed by ordinary observers." This strong expression of opinion from a man so calm and judicious as Mr. Paget, must tend largely

to modify the general opinion of surgeons upon this important subject.

In a case, to be related further on, I performed a modification of Mr. Paget's operation, suggested by Mr. Holt, who has used it on two occasions. In place of cutting the sublingual attachments with the knife—which some might be timid of attempting, lest serious hemorrhage should ensue—I divided them by the wire ecraseur; in order to pass the wire it was only necessary to insinuate a curved needle under the tongue as far back as could be reached, and to attach the wire to the loop of the ligature which the needle carried. The remainder of the operation did not differ from Mr. Paget's.

For most cases of epithelioma of the tongue this operation will, probably, suffice; for a few rare and extreme cases Mr. Syme's may, perhaps, still be resorted to; but there are cases in which the disease, without being so extensive as to call for this latter-named procedure, may be situated so far back as not to be within reach by the milder methods of Paget or Nunneley. For these I venture to propose a mode of operation which I adopted four years ago in two cases, and which is described in my work on cancer, published in 1864. By it I was able to go farther back than could possibly be done by any other method short of Mr. Syme's. The ecraseur was worked immediately in front of the epiglottis, and with an ease that was most surprising. The steps of the operation are as follows:—An incision is made through the lower lip, at a distance of a quarter of an inch from the angle of the mouth; this incision passes downwards nearly half an inch, and then turns backwards, and slightly upwards (in a line towards the orifice of the external ear), until it reaches as far back as a point corresponding with the last molar tooth in the lower jaw. This incision goes through all the tissues—first of the lip, and then of the cheek. The object in making the incision at first downwards is to avoid the ugly pucker which results from all incisions that spring directly from the angle of the mouth. This incision gives ample room to enter a strong Liston's needle under the very root of the tongue, and to push it on until the point appears at the other side, close to the bone; a hook or forceps can now be brought to bear upon the loop of the ligature in the eye of the needle, and when it is firmly seized the needle may be withdrawn; the loop is now divided; the chain of an ecraseur is fastened to one of the strands, and is pulled through; it is brought round the base of the tongue, as far back as is desired,

and is slowly tightened; when the screw has been worked for a minute or so, and enough cut through to leave room for a second ecraseur, this is passed by help of the second strand of cord; by its means the sublingual attachments are divided; and, when both ecraseurs are worked home, the tongue is found to be entirely severed from its attachments. It is easy to guide the ecraseurs, and prevent their slipping from what we wish them to cut, by a few strong pins, or by needles in fixed handles; pushing these in here and there we can guide the ecraseur, whether chain or wire-rope, into the line best suited for our purpose. Should it be advisable to remove only a part of the tongue, it is easy to enter the needle as far back as we wish, to push it on to the central line, and then to turn it up, so that the point shall make its exit on the upper surface of the tongue. The needle is best entered while the tip of the tongue is simply raised towards the roof of the mouth; the tongue is then allowed to fall quietly into its place, and the needle is pushed on to the central line, or thereabouts; the tongue is now seized, and drawn forward as far as possible out of the mouth; the needle point can then be directed, so as to make its appearance as far back as is desired. The only difference in the subsequent steps of the operation is, that the ecraseur may be required to cut in three directions instead of two. I have, however, found it possible to remove half the tongue with two ecraseurs by the help of strong guiding needles.

For the removal of the entire tongue, or for removal of any segment which reaches far back, this operation will be found to combine the greatest ease to the operator with the least danger to the patient.

All operations which include section of the bone, or even incisions among the sublingual muscles and fasciæ, are prone to be followed by purulent infection and by inflammatory congestions of the lung. On the other hand it is not easy to get a needle under the tongue far enough back to divide the sublingual attachments efficiently; and until that is done the important ligature round the base of the organ cannot be got into its place. The needle must first be got under and round the base of the tongue before the other attachments can be effectually dealt with, and this can be done most easily by my operation. When the tongue is removed, a few points of interrupted suture will hold the flap of the cheek in its place, and in a few days there will only remain a line of cicatrix, which will scarcely be perceived, in the

male, among the hairs of the whisker, and which, even in the female, will leave but a trifling scar. It is, however, remarkable that epithelial disease of the tongue is comparatively rare in the female—a fact, perhaps, to be attributed to their general avoidance of the fragrant weed.

Mr. Oldham's woodcut gives the outline of Mr. Syme's, Regnoli's, and my own operations, and shows the spot where Mr. Nunneley's needle enters.

The galvano-caustic wire has been used by Dr. Alexander Simpson, of Edinburgh, to remove segments of the tongue; and it is quite possible that occasions may arise in which this method may be found to possess peculiar advantages. I have seen Dr. Bennett use the galvano-caustic for the removal of epithelial disease of the nose; it removes the part rather slowly, but without hemorrhage. However, it labours under a serious disadvantage—it is impossible to be sure that the entire disease is removed. The cautery confounds all tissues, whether sound or diseased, in a similar and undistinguishable eschar. This will, I fear, be a fatal bar to its use, unless in very special cases.

I shall now proceed to detail a case of epithelioma of the tongue, which is remarkable for its slow progress, and in which I removed the entire organ, without using the knife, after the method of Mr. Paget, as modified by Mr. Holt.

Donohue, aged sixty-five, a pensioner, of middle size and healthy aspect, though rather pale. He tells me that six years ago he noticed, for the first time, a small sore on his tongue, of a warty appearance, not painful, except for occasional stings or darts of pain through it. This ulcer lay on the dorsum of the tongue, to the right of the mesial line and about midway between the root and tip. It did not grow appreciably larger for more than three years, when, in consequence of the pain, he had recourse to some persons who applied strong acid caustics to it. From that out it grew larger, but at a slow rate, until last May, when it suddenly increased more rapidly, and continued to grow steadily from that until the date of his admission into the Hospital. It occupied a large irregular space on the right side of the dorsum, and along the margin of the tongue; it had also crossed the central raphe and was extending itself to the left of the mesial line. The ulcer had, properly speaking, hardly any visible floor; it was almost entirely margin. The peculiar mushroom-like margins, which characterize

epithelioma everywhere, are most marked on the tongue, and in this case they so encroached upon the floor of the ulcer as almost to conceal it from view.   The outline of these masses was curved or scalloped, showing the coalescence of three or four centres of infiltration.   The entire patch might have been covered by one of the larger florins.   There was much deep hardness of the tongue as far back as the finger could reach, as also on each side and in front of the ulcer.   One of the upper molars pressed upon the centre of the sore; as it was also loose, I extracted it.   The disease was epithelial, unusual from its slow rate of growth, and from the persistent freedom from infection of all the glands.   There was no trace of syphilis, and no history of anything beyond a simple gonorrhea, twenty years, or more, before.   The man, moreover, is married, and has healthy children grown up.   I examined him carefully and I had further proof of his freedom from syphilis in the history of his case, as supplied me by Dr. R. Kerans, of Banagher, who sent him up to me.   I put him on bark and muriate of mercury, as a further test, but it had no beneficial effect on the sore, and I finally concluded to remove the tongue.   As the greater part of the left side was healthy, I wished to save some of it; but subsequent events showed that in this case, as in all epitheliomata, implicating both sides of the tongue, the entire organ must be sacrificed if we are to expect any benefit.   The reason of this is not so much from the rapidity with which the infiltration spreads through the muscular structure of the tongue, as from the susceptibility of the fine areolar tissue in the raphe to become diseased.   I have found that the disease quickly runs back in the raphe, far beyond the line of infiltration in the muscle.   Hence it comes that we often seem to remove all, while there is left behind a most serious centre for propagation of the disease with redoubled virulence.   Lymphatic vessels abound in the raphe, and the fine areolar tissue around them becomes quickly poisoned.

Having chloroformed Donohue, on the 17th of October, 1866, I passed a strong curved Liston's needle under the tongue, so as to include as much of the sublingual attachments as possible in the wire ecraseur which I pulled through when withdrawing the needle. The wire was slowly tightened, and worked home; the tongue was now somewhat loosened, and capable of being drawn forwards. I found it impossible to pass a single loop of wire rope round the base of the tongue sufficiently far back to include all the disease. Accordingly I passed a very strong doubled curved needle through

the tongue, entering the point on the dorsum beyond the disease, as I thought, and bringing it out in the sublingual wound. The double ligature which this needle carried was separated and two ecraseur-chains were successively pulled through the tongue. These were tightened, right and left, and the greater part of the right side and more than half of the left were removed. A small suspicious piece in the centre was snipped off with the scissors; and the entire wound was then mopped well with a 30 grain solution of chloride of zinc. The finger did not recognize any disease in the fragment of tongue which was left behind; but in a very few days the man began to perceive that one point in the stump was the source of the old stinging pain; this spot was freely rubbed with the solid chloride of zinc, on more than one occasion, and the man was sent to the country for a couple of weeks to recruit. His articulation was wonderfully good; all the sounds of the alphabet were distinct, with the exception of d, g, h, j, n, and t; and most words could be made out, even from two days after the operation.

At the end of November, Donohue returned from the country recruited in strength. Examination of the stump showed that the left side had healed—the greater part of the right also; but in the centre was a fissure of uncertain depth, running obliquely upwards to the left, and partly hidden by the overhanging fragment of muscle; to the right of this was an ulcer, with mushroom edges, the size of a grain of rice, shallow, flat, and pale; it was the seat of constant pain, as was also the fissure. Accordingly, I proceeded to remove all the remains of the tongue, and by a nearly similar operative measure; when the attachments of the stump to the floor of the mouth had been freely divided by the ecraseur, two strong needles were pushed through the tongue from below upwards and backwards; by the help of these the chain of the ecraseur was kept from slipping forwards, and the entire of the disease was, at length, removed. The chloride of zinc was freely used; one or two vessels which bled slightly were twisted, and the solid chloride of iron was rubbed over the stump to check a little surface-oozing; this it did most effectually; ice was freely supplied.

The surface of the wound looked sloughy next day, and for two days resisted every effort for its improvement. Chloride of soda was freely used, but without effect. I began to fear for the man's health, as his appetite was failing, from the foul taste and smell of the sloughs; however, by painting the stump with an eight-grain solution of permanganate of potash, in water and glycerine, the sloughs

vanished as if by magic; and in twenty-four hours a healthy surface was obtained. Cicatrization went on rapidly, and all is now healed.

In conclusion, I think, we may look upon the ablation of the tongue as an established operation, to be resorted to as a valuable palliative, in cases otherwise destined to suffer fearful misery. It is to be viewed as an occasional method of prolonging life, to a considerable period, or perhaps even of saving it entirely from the ravages of one of the worst diseases. That even partial removal of the tongue may be followed by a very long interval of freedom from relapse, is proved by a case long since recorded by Mr. Tufnell. In this instance after removal of a segment of the tongue by the now exploded method of ligature, upwards of eight years elapsed before death took place from a return of the disease. This result was no doubt exceptionally favourable; but let us suppose for a moment that the disease had, in this case, been left to run its course without a check, and we cannot but conclude that long before the half of these eight years had passed over the patient's head she would have died in misery.

It cannot be too strongly impressed on the mind that the operation is now painless, almost free from risk, and that the relief is immediate and immense. The impairment of articulation is by no means great—nay, it is often diminished; and though death must occur, it is much less painful, and is not preceded by the agonies of a protracted starvation.

I append here a table of such cases of removal of the entire tongue, or of considerable portions of it, as I have found recorded in the journals, and of some which have been communicated to me. I take this opportunity of thanking those who have answered my enquiries on the subject for their courtesy. The table is, no doubt, very imperfect; but it will be, at least, of some assistance towards ascertaining the results of the various operations, and may help as a basis for future and more extended statistics:—

Name	Age	Duration	Cause	Extent of Disease	Glandular Poisoning	Operator	Operation	Date	Result
Sarah K.,	74	9 months,	Smoking,	From base to tip,	Tonsil and palate,	Mr. King, of Hull,	Mr. Syme's older operation,	March, 1862,	Death in nine days from gangrene, pyemia, congestion of lungs.
Sarah V.,	38	20 years,	..	Tumour 8¾ inch.×7½, non-cancerous,	..	Mr. Folker, Stafford,	Abscission by knife,	July 8, 1862,	Recovery; tumour weighed ¼ lb.
G. S., shoemaker,	47	5 months,	..	All but the very root,	None,	Mr. Syme,	Mr. Syme's older operation,	Dec. 9, 1857,	Death, on seventh day, from inflammation of the lungs.
A man,	58	6 years, [But had undergone an operation by ligature 4 months back.]	..	Ditto,	None,	Mr. Syme,	Ditto,	July 31, 1858,	Death, on fourth day, from same cause.
Mr. W.,	52	Many years; seriously from 3 years,	..	Entire tongue,	Not stated,	Mr. Syme,	Modified Syme's	Dec. 29, 1864,	Perfectly well at present date (Jan. '67).
Female,	56	2 years,	..	Nearly all,	Not stated,	Mr. Syme,	Ditto,	May 10, 1865,	Died after 9 days.
James Burke,	60	1 year,	Wart, going on to epithelioma, a smoker,	Anterior third,	Not enlarged,	Mr. Wharton,	Ecraseur,	Jan. 6, 1865,	Relapse in a few months in submental glands.
W. C. (male),	72	14 years,	..	More than anterior half,	Not,	Mr. Holt,	Ecraseur (Holt's modification of Paget's),	March 5, 1866,	No return in tongue as yet.
G. B. (male),	57	2 years,	..	Right half,	Slight,	Mr. Holt,	Ditto,	Not given,	Died, after 6 months, of cancer of œsophagus.
Rawling, railway guard,	35	Upwards of 12 months,	..	..	Glands not involved,	Mr. Nunneley,	By submental puncture and ecraseur. The entire tongue removed in each case,	Oct. 1, 1861,	Died, 3 years after, from phthisis—mouth quite sound.
Cross, printer,	54	2½ years,	..	..	Submental glands involved. Had two previous operations,	Mr. Nunneley,	Ditto,	Feb. 29, 1862,	Died, some months afterwards, from internal cancer — probably of liver.
Wm. Steel, painter,	35	12 months,	..	..	Not involved,	Mr. Nunneley,	Ditto,	Oct. 30, 1865,	Now perfectly well.

Name	Age	Duration	Cause	Extent of Disease	Glandular Poisoning	Operator	Operation	Date	Result
Mrs. Macleod, -	44	10 months,	..	..	One gland enlarged and indurated,	Mr. Nunneley,	Ditto,	Jan. 15, 1866,	Much relieved by the operation; died, four months after, from submental cancer; stump of tongue quite well.
Ann Lomas, -	57	18 months,	..	..	Glands not affected,	Mr. Nunneley,	Ditto,	May 4, 1866,	Perfectly well.
Charlotte Thompson,	48	6 months,	..	..	Glands not affected,	Mr. Nunneley,	Ditto,	Nov. 21, 1866,	Perfectly well.
A butcher, -	50	Under 1 year,	..	About three-fourths,	None,	Mr. Paget,	Through mouth by knife and ecraseur,	October, 1865,	More than a year able to work at his trade, then died of disease in sub-maxillary lymphatics.
Female, -	49	9 months,	..	Ditto,	None,	Mr. Paget,	Ditto,	Jan. 6, 1866,	Still well a year after.
Omnibus driver, -	45	Under 1 year,	..	About half,	Not cancerous,	Mr. Paget,	Ditto,	A month ago.	
Pat. Gallagher, -	50	3 months,	Smoking,	Left half, near the root,	Not engaged,	Mr. Collis,	Two ecraseurs and incision through cheek,	Jan 28, 1863,	Alive in January, 1865; not since seen; supposed to be dead, as disease had appeared in submaxillary glands and rest of tongue.
Darby Sullivan, -	60	..	..	Left half,	Ditto,	Mr. Collis,	Ditto,	May, 1863,	Relapse, August, 1863— Died.
John Young, -	65	5 months,	..	Right half,	Floor of mouth engaged,	Mr. Collis,	Syme's operation,	June 21, 1865,	Died—pyemia, gangrene of wound, July 5.
Philip Donohoe, -	60	6 years,	Smoking,	Centre and right half,	Not,	Mr. Collis,	Holt's modification of Paget's,	Nov. 27, 1866,	Doing well.
A gentleman, -	58	Doubtful,	Cancer, supervening on syph. fissures,	Anterior two-thirds,	None,	Mr. Hutchinson,	Screw ligatures (made for the purpose),	1858,	Good recovery. Remained well a year. Died of cancer of glands of neck, without return in the cicatrix.

Name	Age	Duration	Cause	Extent of Disease	Glandular Poisoning	Operator	Operation	Date	Result
Fanny M'Cartney,	35	12 months,	..	The centre and right side of the tongue only, and not far back,	None,	Mr. Fiddes, of Kingston, Jamaica,	Mr. Syme's older operation—entire tongue removed,	Sept. 2, 1858,	Perfectly sound after 7 months, but died in 12 from recurrence of the disease.
A man,	Mid. age,	..	..	Small, limited to right side, and not far back,	..	Mr. Fiddes,	Ditto,	Dec. 1860,	Well in May, 1861; suffering from recurrence in 1862.
..	..	..	Smoker,	..	..	Mr. Hutchinson,	Two-thirds of tongue removed,	..	Died, after 18 months, from disease in glands.
J. M'D.,	44	2 years,	..	Very considerable, with almost fatal hemorrhage,	Not stated,	Dr. Nottingham (Liverpool)	Sedillot's ecraseur,	April 14, 1863,	Discharged, to all appearance well, May 14.
Mrs. M'Millan,	50	3 months,	..	Ulcer on right side of tongue size of shilling,	None,	Dr. Geo. Buchannan,	Knife,	June 18, 1865,	Rapid relapse, necessitating a second operation.
The same,	..	Relapse,	..	Nearly all right half of tongue,	Right sublingual gland,	Dr. Geo. Buchannan,	Syme's,	Aug. 12, 1865,	Union of jaw in a month; freedom from return up to present date, Jan., 1867.
D. M'Donald,	43	2 years,	..	Entire tongue, removed—greater part diseased,	Sublingual	Dr. Geo. Buchannan,	Syme's,	Dec. 11,	Pyemia on ninth day.
Elizab. Aitchison,	64	1 year,	..	Right half removed,	Not affected,	Pat. Heron Watson,	Three needles and ecraseur, under chloroform	Nov. 1, 1865,	Perfectly well, able to articulate.
A woman,	30	..	..	Right half,	Not affected,	Dr. Reddy, Montreal,	Ecraseur,	May 10, 1858,	Relapse, as under,
The same,	..	Relapse,	..	Left half,	Not affected,	Dr. Reddy,	Ditto,	July 2, 1858,	In good health up to Oct. 1863, when disease appeared in tonsil.

I have been in the habit, of late, of using the solutions of chloride of zinc, sponged freely over the fresh surface in all operations for epithelioma and cancer, as recommended by Mr. Campbell de Morgan. It is yet too soon to judge of the effect of this treatment, which, however, I am disposed to look upon as beneficial.   It can do no harm, and not improbably it does good, by destroying lingering fragments or stray germs of disease.

As an example of the occasional benefits which result from partial removal of cancerous tumours, I may here mention a case of cancer of the tonsil, which came under my care in 1862. The man was seventy-five years of age, and otherwise healthy; a tumour had formed on his left tonsil which grew rapidly downwards and inwards. As long as he refrained from the act of swallowing it gave him no special distress, but when the larynx moved upward the point of the tumour came against the rima glottidis. At first, as the pressure was but slight, the irritation was also slight, but soon, as the tumour continued to grow, the difficulty of swallowing became extreme from the spasm which was set up. I removed a large piece of the tumour, which appeared to be of a cancerous nature; the operation was not easy to effect, as the least touch brought on spasmodic efforts to swallow, followed by threatened suffocation.   So urgent were the symptoms that I contemplated tracheotomy on the instant; but fortunately I was, at last, able to seize the tumour firmly, and by pushing it forcibly back I kept it from irritating the larynx, and I then removed it. The old man had immediate ease, and a respite of three months, after which time I repeated the operation with similar advantage. After that I lost sight of him, and I suppose he died either of suddem spasm or of extension of the disease to the glands. However, I had the satisfaction of prolonging his life, for a few months, by rescuing him from starvation on the one hand, and spasm of the glottis on the other.

I shall now give an account of a vascular tumour of the tongue in which ligature was used, after a different fashion from that usually adopted when dealing with this organ:—

Case of Vascular Tumour of the Tongue, Cured by a Temporary Ligature.—In the year 1854, a child, named Doyle, aged two years, was brought to me with a vascular tumour of the tongue.   It had appeared at birth as a red point at the left side of the tip of the tongue.   From this it grew steadily, and when brought to me it had reached the size of a small walnut; it had extended into the

substance of the tongue as far as the mesial line, and backward so as to implicate altogether about one-third of the left half of the tongue. It was blue in colour, with bright red dots here and there on the surface. When compressed firmly it became much smaller, but filled again the moment the fingers were removed. The feel of it was just like a bag of live worms. It had bled violently on one occasion, when the child had bitten it in falling; with much difficulty the parents had stopped the bleeding. They were much alarmed at this, and at its rapid growth. Nevus of the tongue is not very common, and this happened to be the first case I had seen. I treated it as I have often treated nevus of the lip, or elsewhere on the skin. I included the entire growth in two ligatures, tied with some force, so as to compress the larger vessels, and stop the circulation in them, without completely strangulating the mass. In twenty-four hours I cut these ligatures, and removed them. The tumour then shrunk to half its former dimensions, and was little larger than the portion of healthy tongue should have been whose place it occupied. It was firm and solid ; a blue grey on the surface, and slimy ; with a line of superficial ulceration separating it from the sound parts. Still its heat was good. Next day it had recovered some redness; and, to be brief, in a few day's time the line of ulceration had healed, the tongue became of normal size, and but for the blue colour of the affected part, nothing abnormal would have been noticed. The consolidation of the part advanced from day to day, and I have the satisfaction of knowing, after twelve years, that the cure has been permanent. The boy is now fourteen years of age, and is serving his time in a shop in the Liberties. He has never had hemorrhage from the tongue, nor is it now at all larger than it ought to be; his articulation, as might be supposed, is satisfactory.

I conceive that this method of treating nevi deserves some attention. It is quite practicable to tie a nevus so tightly as to cause its consolidation without necessarily causing it to slough. The ligature can be removed in from twenty to forty-eight hours, according to the density of the integument and the size of the nevus. Small ones will slough off in half the time that a large one will take to consolidate; that is, if they are tied equally tight. It is impossible to give any rule for gauging the tightness in any given case. This is just one of the points where each man must learn by experience. This, however, can be inculcated, that it is better to tie too loosely than too tight, where a mark is of

consequence. A repetition of the ligature is a lesser evil than a large cicatrix.

I may here give details of a singular example of erectile tumour in the lip.

Erectile Tumour of the Lip.—This tumour was not a common nevus, but rather a genuine erectile tumour, composed of a mass of hypertrophied veins and fibro-elastic tissue. It grew, without any assigned cause, on the lower lip of a middle-aged woman, named Honor Reynolds, a native of Arklow. She denied having a habit of biting her lip; nor could she say when she first observed the enlargement. When I saw her, in November, 1864, the lip was about four times as large as it should be, projecting like a large red sausage. It was firm, not very much reduced by pressure, and had no pulsation in it; it was bright red in colour, like the natural lip, and devoid of pain. It caused her no uneasiness other than mental; but she was most urgent to be rid of it. Wishing to spare her looks, I made two transverse incisions, including an elliptical
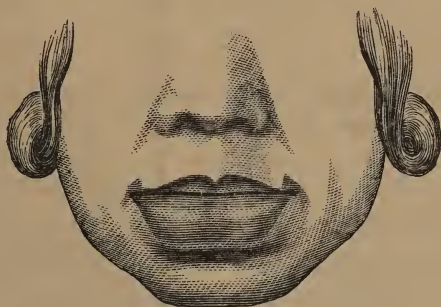
portion of the lip between them, and removed a wedge-shaped piece from the centre of the growth, I so arranged the lines of incision, and subsequent sutures, that the line of union was hidden. It did not heal kindly, and in two months the lip had grown as large as ever. I had then nothing for it but to extirpate the entire of the parts to which any morbid material extended. Accordingly, on January 20, 1865, I took out a very large V shaped piece, as for epithelioma of the lip, and this time with the result of a complete and permanent cure.

I have met this form of tumour in the groin, prepuce, and scrotum, nymphæ, both greater and lesser, on the nose, and, as in this case, on the lip. It is composed of the ordinary elements of skin, with an excess of the venous and elastic tissues in varying proportions. As far as my experience goes, it is liable to return if not wholly extirpated. I have never seen it degenerate into any worse form of growth; but there is no reason why it may not be sometimes a nidus for cancer or epithelioma. When it is inclined to grow it is certainly best abolished.

Art. II.—*Lithotrity, and its After-treatment.* By GEORGE H. PORTER, M.D., Univ. Dub.; F.R.C.S.I.; Senior Surgeon to the Meath Hospital and County of Dublin Infirmary; Surgeon to Simpson's Hospital; Examiner in Surgery Royal College of Surgeons, Ireland; Consulting Surgeon to the Coombe Lying-in Hospital; Member of Council of the Surgical Society of Ireland, and of the Pathological Society of Dublin; Lecturer on Clinical Surgery.

CASE I.—PATIENT, AGED SIXTY-THREE YEARS; LITHIC ACID CALCULUS, OF SMALL SIZE; LITHOTRITY; RECOVERY.

CASE II.—PATIENT, AGED FIFTY-NINE YEARS; LITHATE CALCULUS, OF MEDIUM SIZE; LITHOTRITY; RECOVERY.

IT will be freely acknowledged that the most brilliant surgical operation proves unsuccessful occasionally, owing to the after-treatment. The many difficulties with which the surgeon has to contend, more or less excuse him for consequences, many of which, very probably, the peculiarities or disobedience of his patient will best explain. Perhaps there is no operation which bears out this statement more forcibly than lithotrity, which is in itself difficult to perform properly, but still is one whose favourable termination may be hoped for more from the judicious subsequent care of the case, than from the most expert manipulative skill during the performance of this triumph in surgery. A stone having been fully crushed in the bladder, it becomes one of the most important parts of the after-treatment of the case to remove all the fragments.

PLATE 1.
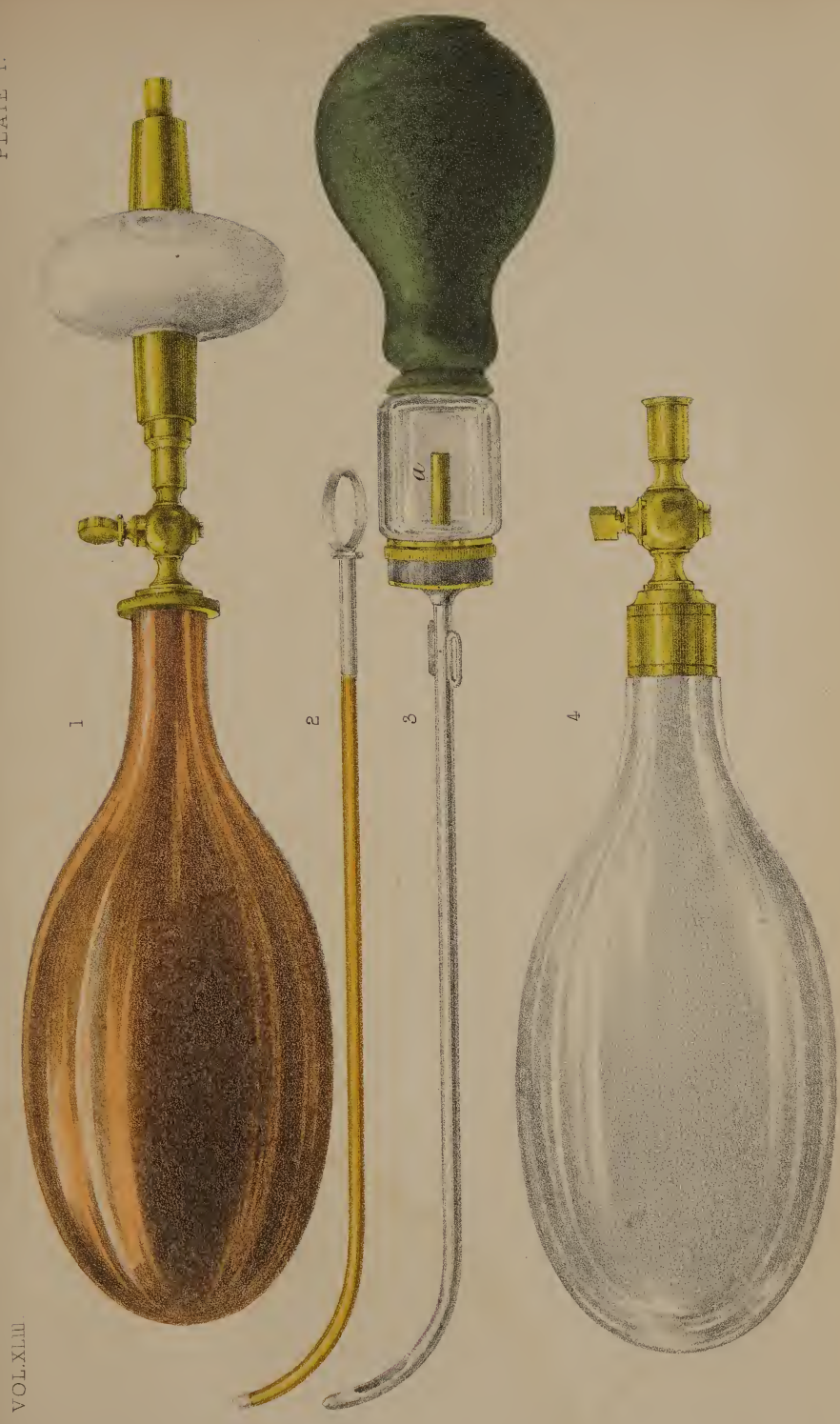
And, as the process of disintegration must be so frequently repeated, lithotrity may, with great propriety, be regarded as a series of operations, each operation or sitting being but a step towards the desired end.

In the February number of this Journal for 1866 I published some observations on crushing stone in the bladder, together with three cases in which this operation had been successfully performed. I am now about to add two additional cases; and in reference to these latter to make some remarks upon a point in the after-treatment of cases of lithotrity, further experience having led me to modify my opinion as expressed on the subject in my former paper. The point to which I allude, is the removal of detritus by washing out the bladder.

CASE I.—A gentleman, aged sixty-three years, put himself under my care on the 11th July, 1866. He had suffered much from irritability of his bladder during the preceding three months, and for the last three weeks of the time he had been greatly annoyed with pain along the under part of the penis, near the glans. He had passed some very small calculi, and occasionally crystals of lithic acid. My friend, Dr. Ledwich, had previously sounded him, and detected the presence of a stone. His urethra was large, freely admitting a No. 13 metallic bougie, and its introduction proved that the canal was not irritable. His prostate was natural, and his general health had not apparently suffered. Assisted by Dr. Ledwich, I placed him lying on a sofa, and introduced Mr. Henry Thompson's flat-bladed lithotrite, for the purpose of measuring the calculus. I was fortunate enough to seize it almost immediately, and ascertained that the diameter in which it was caught measured half an inch. I then screwed home the male blade, and crushed the stone, and shortly afterwards I caught a small fragment, and broke it.

July 13th.—Second sitting. I caught and broke three fragments of small dimensions, and washed out fifteen grains of detritus with Mr. Clover's syringe.

July 17th.—Third sitting. Two fragments crushed, and six grains of detritus removed by Clover's syringe.

July 20th.—Fourth sitting. Four small pieces were broken, and a large fragment was washed out by means of Clover's apparatus.

August 1st.—Fifth sitting. One small piece was seized and broken, some fine detritus removed with Clover's syringe.

It would be useless to note the daily progress of this gentleman's

case. He improved rapidly, all symptoms of his complaint disappeared, and Dr. Ledwich and I were unable to detect any unbroken fragments by careful sounding on the 20th of August. He is now in the enjoyment of excellent health and spirits, and takes a great deal of exercise, frequently driving on an outside car, as much as twenty miles a day, over rough country roads.

Between the sittings detritus came away during micturition, which, together with that brought out in the jaws of the lithotrite and removed by means of Clover's instrument, amounted to seventy-nine grains. In all those cases some portions of the stone must have been lost, owing to the difficulty of separating the fine debris from the urine, and inducing attendants to carefully preserve this fluid for the surgeon's inspection.

CASE II.—A gentleman, aged fifty-nine years, consulted me in August, 1866. He had been suffering from an irritable condition of his bladder for seven years previously, and for the last two years the symptoms assumed a serious and painful character. He was obliged to pass water very frequently, both by day and night. The pain, whilst expelling the last drops of urine, was most severe, and he voided it bloody whenever he either walked a distance, or took carriage exercise.

He had taken a variety of medicines intended to relieve his distressing state, but without any very decided benefit. He had suffered from retention of urine twice within a short time before he came under my care. His health had not given way as much as might have been expected. His urine was highly acid, as ascertained by my friend, Dr. P. C. Little, who saw this gentleman along with me; he also carefully tested it for albumen, and found only a trace, which could be explained by the presence of blood corpuscles. On the 29th of August I sounded him with Thompson's sound, and detected the stone. It measured six-eighths of an inch in diameter.

His urethra was large, and pervious, but rather irritable, from the frequent passage of bougies before I saw him. His prostate gland was of healthy dimensions. He had expelled some small calculi from time to time, two of which, about the size of duck shot, he gave me; their composition, on analysis, was found to be lithate of ammonia.

September 2nd.—Assisted by Dr. Little, I proceeded to crush the stone. I placed the patient lying on his bed, with a pillow under

the nates, and his head comfortably supported with other pillows. I had desired him to keep his urine for two hours previously; but as he was unable to do so, I injected four ounces of tepid water into his bladder. I then introduced Mr. Henry Thompson's flat-bladed lithotrite with ease, quickly seized the calculus, and broke it. Five fragments were subsequently caught, and crushed. Having withdrawn the lithotrite, and introduced Clover's catheter, I attached its syringe, filled with tepid water, and washed out ten grains of detritus. I then gave the patient a glass of sherry, and placed a quarter grain morphine suppository in his rectum; he was put comfortably in bed, with a jar of hot water to his feet.

September 6th.—The second sitting took place. Between this date and the first operation, he passed some fine detritus. On this occasion three fragments were seized, and broken; one of them measured half an inch in diameter. Clover's instrument was also employed, and five grains of detritus removed.

September 12th.—The third sitting. Prior to this sitting he had expelled one large fragment, *per urethram,* by the natural powers.

The fourth sitting took place on the 18th of September. He requested me to administer chloroform, as he felt very nervous, and dreaded the lithotrite, not because he had suffered pain to any great extent, but he felt depressed, and wished for the anesthetic. He was rendered insensible, most carefully and efficiently, by my friend, Dr. Cruise. On this occasion I seized four pieces, and crushed them, and immediately afterwards washed out twelve grains of detritus with Clover's syringe. In the jaws of the lithotrite, also, a good deal of pulverized calculus came away. In the interim between this and the next sitting several fragments of small dimensions passed off.

September 24th.—The fifth sitting. He was again chloroformed for me by Dr. Little. I caught and broke five fragments, and used Clover's syringe with the effect of removing nineteen grains of detritus, some large pieces having come away by this mode of washing out the bladder. I have not detailed the various symptoms from day to day in this case, as such would only weary the reader. Suffice it to say, after this operation he progressed rapidly; all vesical irritation subsided; his health vastly improved, he was able to take several drives into the country, and to retain his water for hours.

Sixth, and last, sitting took place on October 12th, when he was

again chloroformed. I introduced the lithotrite; but the most careful examination of the bladder failed to discover any fragment of the calculus remaining unpulverized, and but two grains of detritus were sucked out with Clover's syringe; the whole quantity removed weighed one hundred grains.

In both the cases just detailed, it will be perceived that I used the flat-bladed lithotrite of Mr. Henry Thompson. Its power is quite sufficient for medium-sized calculi, and its beautiful construction renders it very safe while feeling for, and breaking the stone. The medical treatment consisted in the administration of a liberal allowance of wine, with plenty of beef tea; and, as a general drink, oatmeal tea, which I have found in those cases more soothing to the urinary passages than decoction of linseed, barley, or gum-water. Whenever mucus appeared in the urine after a sitting, I ordered a mixture, containing infusion of buchu with tincture of hyoscyamus and liquor potassæ; and occasionally, small doses of balsam of copaiba. I introduced a quarter-grain morphine suppository into the rectum after each sitting, and also whenever urethral or vesical irritability existed, with the most marked benefit.

It is evident that as soon as a stone within the bladder has been reduced to fragments, it is most desirable that those fragments should be removed as soon as possible. For those who do not employ the scoop, following the practice of Sir William Fergusson, there remain but two means of effecting this object; one method, deprecating interference with the bladder as much as possible, leaves the fragments to the unaided contractile force of the viscus, trusting they may be expelled with the urine in due time; the other plan, and more trustworthy one, endeavours to promote their removal by washing out the bladder with a strongly-injected stream of water, expecting the return current to carry out much of the detritus stirred up in the bladder. It must, however, have been observed by practical surgeons how often the amount of detritus removed in this way has disappointed their expectations; and it was the failure of the means which I then had at my disposal to remove detritus, which obliged me in my last paper on lithotrity, to place little value on the practice of washing out the bladder. The water thrown in with the ordinary evacuating catheter and syringe returns with but *little* force, particularly in cases in which the tone of the organ has been in a great measure weakened or lost. It has always been a desideratum to supplement the force of the bladder in the

removal of detritus. The late Sir Philip Crampton saw the necessity of some efficient means of doing so, and not only suggested but employed a most ingenious contrivance, which, in my student days, I saw him use in the Meath Hospital, and which is well described in the number of this Journal for January, 1846, page 22, in the following words:—" The apparatus consists of a strong glass vessel of an oval form, and six or eight inches in length, by three in diameter, and capable of holding about a pint and a-half of water; to this vessel is attached a tube of about half an inch bore, furnished with a stop-cock. The air being exhausted by means of an exhausting syringe, and one of Heurteloup's wide-eyed steel evacuating catheters being introduced into the bladder, it is next attached to the exhausted vessel; the stop-cock is then turned, and a communication being thus established between the bladder and the glass, the pressure of the atmosphere is by this means brought to bear on the bladder, and supplies an expulsive power, which may be increased to any required amount." Figure 4, plate I, gives a tolerably accurate idea of this instrument. It has been drawn from the *original* one, which my colleague, Mr. P. C. Smyly, kindly placed at my disposal for that purpose.

The instrument of Mr. Clover, of London, for injection of the bladder, and withdrawal of the injected liquid by *suction*, is such an improvement upon the former means of removing debris by injection, that having found the advantages its employment affords in speedy and safe removal of the fragments of calculi, I consider its use an important auxiliary in the after-treatment of lithotrity. It must be admitted that there can be no more important element in the after-management of a case of lithotrity, or a point more conducive to the success of the operation, than early removal of the detritus, and without injury to the prostate or urethra; and improvements in the surgical appliances for lithotrity are to be much encouraged in this direction as well as in the means of primary comminution of the calculus. By crushing the stone, in the first instance, a comparatively smooth and single calculus is converted into several angular and irregular stones; the bladder, moreover, having become more or less irritated by instrumental interference, the patient is not much better off than he was before the operation. His hopes of relief, therefore, rather depend on the removal of the crushed fragments. Every practical lithotritist will bear me out in saying that the delight of a patient is most remarkable when he sees the fragments; and, on the contrary, his

spirits are depressed when the debris is tardy in making its appearance. I have found the instrument devised by Mr. Clover (to whom the profession is also indebted for an apparatus for the safe administration of chloroform) most efficacious in removing any fragments sufficiently reduced in size to pass through the large catheter attached to his syringe. For those who may not have had an opportunity of seeing it, I have added a drawing, Plate I., Fig. 3; and in explaining it I think I can best do so by quoting Mr. Clover's own description, as given in his letter in *The Lancet* for May 12th, 1866. He says:—" My instrument consists of a glass cylinder two inches long and two inches wide, having an eight-ounce India rubber ball at one end, and a vulcanite mount at the other, in which is a hole which fits closely to a collar fixed just above the rings of the catheter, so as to allow the catheter to project three quarters of an inch inside the glass vessel."

The instrument that I have been in the habit of using was procured for me from Weiss, of London, by Messrs. Fannin, of Grafton-street. It differs from, but possesses advantages over, that described by Mr. Clover, namely, the mount is of brass attached to the glass, and to it is *screwed* on the stopper, which has a tube, Fig. 3, the calibre of a No. 12 catheter, fixed to it, and extending into the cylinder about three quarters of an inch. This arrangement renders it unnecessary for the catheter to project into the glass portion of the instrument, and allows the apparatus to be attached to, and detached from the catheter with greater ease.

It has been proposed by my friend Mr. Fleming to improve the instrument by adding an offset to the glass part, resembling that of the ordinary breast-pump—*vide Dublin Quarterly Journal of Medical Science* for February, 1866, and by Mr. Maunders—*vide London Hospital Reports*, Vol. III., 1866, page 216. The late Sir Philip Crampton was not unmindful of this addition to his instrument, as will be seen. Plate I., Fig. 1, shows a glass receptacle attached to the brass tube united to a copper cylinder, which he had constructed to bear greater exhaustion than the glass one. I confess that, although ingenious, I cannot see the advantages of such an offset to the glass portion of Mr. Clover's syringe. When the end of the catheter extends sufficiently into the cylinder it renders it most difficult, if not impossible, to force back any fragment that may have been sucked into the instrument. Indeed, in practice I have found that a good deal of debris remains in the

India rubber portion of the apparatus instead of the glass, and certainly if it ever passes beyond the projecting portion of the catheter into the glass it will be retained just as well as with the offset. To the practical surgeon I consider this instrument of Mr. Clover's a great boon, not only to remove detritus after lithotrity, for which he suggested it, but also for the removal of clots of blood from the bladder, as I myself lately found it most efficient in a case of bleeding into this organ, arising from diseased prostate. The catheter should be of the size of No. 12, with a large eye in the concavity of its curve, and provided with a stilette made of gum-elastic (Plate I., Fig. 2), to fill this aperture during its introduction and withdrawal.

The fragments of the calculus removed by lithotrity in the first case were analyzed by my friend Dr. William Daniel Moore, who stated that it was composed of lithic acid. It is unusual, at an advanced period of life, to find a calculus wholly or so largely composed of lithic acid, although in some or other of its salts it is one of the most usual ingredients of all calculi. But while there is no age exempt from the occurrence of urinary concretions, into which lithic acid enters largely, they are, perhaps, more associated with the urinary diseases of earlier than of later life. With this form of calculus there are certain advantages in the performance of lithotrity; there is less apprehension of delay and tediousness in the secondary crushings, because the absence of phosphatic salts indicates an integrity of the mucous membrane of the bladder, and an acid rather than an alkaline condition of the urine, both of which circumstances very much promote the success of any operation implicating the interior of the bladder. In cases where there is reason to believe lithic acid, or its salts, to be undergoing deposition in the bladder, it is dangerous to render the urine alkaline in the hopes of interrupting the formation of a calculus, on account of the tendency which the phosphates exhibit of forming in layers round lithic acid calculi. As soon as the urine is made alkaline, although the deposition of lithic acid may be checked, a layer of triple phosphate will replace it, and the calculus will increase in size as rapidly, if not more so, than before. In the after-treatment of cases of lithic acid calculus it is of importance to prevent a re-deposition in the bladder of this ingredient of the urinary excretion, which will be very liable to occur if the diathesis be not combated. With regard to the urine, it is not necessary to render it more than neutral, for which purpose the waters of Vichy

and the carbonate of lithia are well adapted.   It is to be borne in mind that should it be rendered alkaline the phosphates are ever ready to take advantage of a small hemp-seed or pin-head particle of gravel, and upon it, as a nucleus, to initiate a rapidly-growing stone. The object of keeping the urine neutral is to keep the lithic acid in a soluble condition until after its removal from the body. It is also most important to keep the action of the skin healthy, as it has been ascertained that the quantity of lithic acid in the urine is augmented when the cutaneous transpiration is interfered with. Warm clothing, the wearing of flannel or chamois leather next the skin, occasional diaphoretics, and the use of the vapour bath, are means of warding off the excessive formation and deposition of lithic acid concretions which will be worthy of attention after the removal of a calculus of this description.   At the same time it will be necessary to endeavour to restore the proper tone of the organs of digestion, and to combat any peculiar form of dyspepsia which may be present, since the lithic acid diathesis is so much due to defective primary assimilation.

ART. III.—*On the Theory and Principles of the Ophthalmoscope.* By HENRY WILSON, F.R.C.S.I.; L.K.&Q.C.P.I.; Assistant Surgeon to St. Mark's Ophthalmic Hospital; Member of the Royal Irish Academy, &c., &c.

IN the production of the *erect* image we employ the ophthalmo-scope mirror alone, and make use of the refracting media of the eye itself as a lens; in this examination the observed as well as the observer's eye must be accommodated for distance, and be very close to each other—about two inches; the emergent rays being parallel, will be united on the examiner's retina, and form there an inverted image of the observed fundus; this image, which is magnified by the dioptric apparatus of the observed eye itself, and apparently situate behind the eye, will, however, be mentally perceived as upright.   Another mode of producing the erect image consists in the employment of a concave lens, as shown in the

accompanying illustration. If *a b*, Fig. 5, be two points in the illumined fundus of A, pencils of rays will emerge parallel to the axial lines *a* L, *b* L to form at the anterior focal distance of A an image of *a b*. The concave lens L, however, being now inter-

Fig. 5.
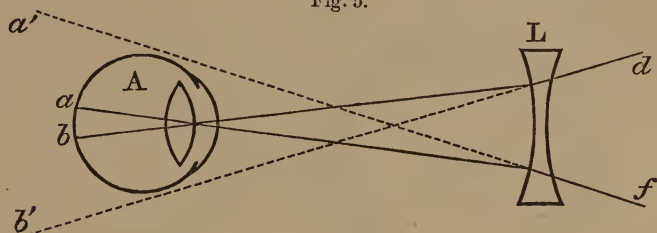
posed, these rays are diverged to *d* and *f*, and they appear to proceed from the prolongations of these lines—from *a' b'*, at which place an enlarged *upright image* of *a b* will apparently be situated. The direct examination is principally of value in cases where it is desirable to obtain a more accurate observation of the minute details, such as individual vessels or nerve fibres, or in the determination of anomalies of refraction, such as myopia or hypermetropia. It is, however, attended with more difficulties than the indirect method of examination; it necessitates, also, a very close approximation of patient and examiner, which may, for various reasons, be undesirable or objectionable; the enlargement is very considerable, and therefore only a small portion of the fundus can be seen at a time; moreover, the concave mirrors of the ordinary ophthalmoscope do not suffice for this examination. I would, therefore, recommend beginners first to employ the indirect method of examination; and as soon as they may have become familiar with this method, and the reversed image, they may proceed to the direct examination.

As might naturally be expected, there is a great variety in the form and construction of ophthalmoscopes; but no matter how they may apparently differ in outward shape and appearance, they are, one and all calculated to fulfil the same purpose—to illumine the background of the eye by dispersed light, and to allow of the parts so illumined being clearly seen at a convenient position and of a suitable size. The essential part of the ophthalmoscope is the perforated mirror; this may be either of glass, backed with a layer of amalgam, or of metal; the metal specula are preferable to the glass ones, inasmuch as they are less liable to injury, but

chiefly on account of the central aperture through which the observer looks; in the glass mirrors this orifice is more or less in the shape of a tube or canal, from the internal surface and edges of which there is very likely to be most disturbing and annoying reflection of light, which would obviously interfere with the reflected light from the fundus; in the metal mirrors, on the contrary, the walls of the central perforation are extremely thin and the margins sharp, and there can be, therefore, very little, if any, reflection from this part. The illumination afforded by glass mirrors is, moreover, in my opinion, too intense (provided the examiner's eye be normal); the details can be discerned more satisfactorily by a somewhat subdued illumination; hence I am in the habit, when using a glass mirror, of breathing on its surface, or otherwise damping its reflection. When I was in Berlin, some years ago, Liebreich, who has since then removed to Paris, employed a metallic mirror which he had dulled by means of sand-paper. All mirrors have necessarily an opening, and are usually attached to a suitable handle or frame.

Ophthalmoscopes may be divided into two great classes—in one the mirror is concave, and its focus calculated from its surface definite and fixed; such instruments are termed *homocentric.* In the other class the mirror is either plane or convex, and in combination with a double convex lens; in these the focus may be altered, is negative, and situate behind the surface of the mirror; such instruments are denominated *heterocentric.*

An enumeration and explanation of the several individual instruments constructed would be of little practical value. I will, therefore, merely adduce a few of the more important ones, commencing with the *homocentric.*

The simplest, most convenient, and, at the same time, most practical of all instruments is Liebreich's small or hand ophthalmoscope, and is the one I usually employ. It consists, as shown (the actual size) in Fig. 6, of a concave metallic mirror $1\frac{1}{4}''$ in diameter, and of $8''$ focal length,[a] which is fixed into a metallic frame, to which the handle is attached. The central aperture is a shallow, funnel-shaped opening, the base $\frac{3}{8}''$ wide in the metallic frame, the apex nearly $\frac{1}{8}''$ wide in the mirror itself; the sight-hole thus enlarging gradually from before backwards, and the parts adjoining it, and indeed the whole back and sides of the instrument being

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[a] The inch is, for brevity, expressed by (''), the foot by ('), and the line by (''').

thoroughly and effectually blackened there can be no reflection from these parts and no interference with the rays coming to the observer's eye. The handle, about $3\frac{1}{2}''$ long, is screwed into the frame, to which is also attached a clip with a jointed movable arm;

Fig. 6.

the clip serves to hold a small convex or concave ocular lens, which can thus be brought immediately behind the opening in the mirror, and consequently in front of the examiner's eye. The instrument is fitted into a case $5\frac{1}{4}''$ by $2\frac{1}{4}''$, and little more than $\frac{1}{2}''$ thick; two large double convex object lenses, generally of $1\frac{1}{2}$ and $2''$ focus; four small concave ocular lenses, of 6, 8, 10, and 12 inch focus, and one small convex ocular lens of $10''$ focus are likewise fitted into the case. In my own case I have substituted for the $2''$ convex lens one of $3\frac{1}{2}''$, as I find in the general run of cases the enlargement produced by the latter much more satisfactory. One of the uses of the small ocular lenses is to neutralize any error of refraction or accommodation which may exist in the examiner; another use is to effect the examination in the erect image; the convex ocular may also be employed to magnify the reversed image. The large lens, whether convex or concave, which is held before the examined eye in order to produce the image, is styled the *object lens*, to distinguish it from the small one placed in the clip behind the mirror, which is called

the *ocular lens*, and the reflecting surface of the ophthalmoscope is regarded as the front of the instrument. Dr. N. C. Macnamara, professor of ophthalmic medicine and surgery in Calcutta, has lately published a most admirable and trustworthy work on ophthalmoscopy under the title *Lectures on Diseases of the Eye;* but in his description of Liebreich's instrument he states that "attached to the mirror is a clamp by which one of the *object-glasses*, to be found in the instrument case, may be fixed *in front* of the sight hole." This sentence, which to a beginner would be so confusing, shows the necessity for a strict adherence to a uniform nomenclature.

Messrs. Weiss manufacture an ophthalmoscope consisting simply of a concave mirror set in a circular frame, the principal recommendation of which is its portability, as it may, together with a convex lens, be carried in the waistcoat pocket or in a pocket instrument case.

The best of the *fixed ophthalmoscopes* belong to this division; such instruments are so constructed that when adjusted they and the patient's eye shall retain a definite, fixed, relative position, so that once the image is projected a number of persons may in succession, examine it without any trouble or difficulty on their part. Here, likewise, Liebreich's ophthalmoscope is undoubtedly the best. The accompanying diagram, Fig. 7, (about one-third the actual size), shows its construction. A and B are two tubes moving one within the other by means of a rack and pinion, I, and having their interior well blackened. At the end of the tube A a concave perforated mirror, M, is swung on trunnions, *t t*—and a portion of the walls of the tube cut away so as to allow the rays from a laterally placed lamp to fall on the mirror; the tube B carries the convex object lens L, of 2″ focus, swung, like the mirror, on trunnions: this tube is provided with a stout encircling collar, having at one side a projecting clamp, capable of being widened or narrowed by means of the screw H; an upright rod, R, is affixed to the corner of a table by means of a strong clamp, D, and the instrument is then affixed to this rod by means of the perforated projection, and slides up and down on the rod, and may be fixed at any wished-for height by the screw H; on this rod slides also a stout horizontal jointed arm, C, having at its extremity an oval padded cup, which acts as chin-rest; this, of course, is put on the supporting rod beneath the ophthalmoscope. A horizontal bar, F, slides in a box projecting from the upper part of the collar: at the extremity of

this bar is a padded disk, which serves as a head-rest; a small jointed movable arm, K, carries a polished metal ball, for directing the patient's eye to any given position, and a shade, projecting laterally from each extremity of the instrument, at *s* and B, screens the observed and observer's eye from the lamp; there is also a clip behind

Fig. 7.
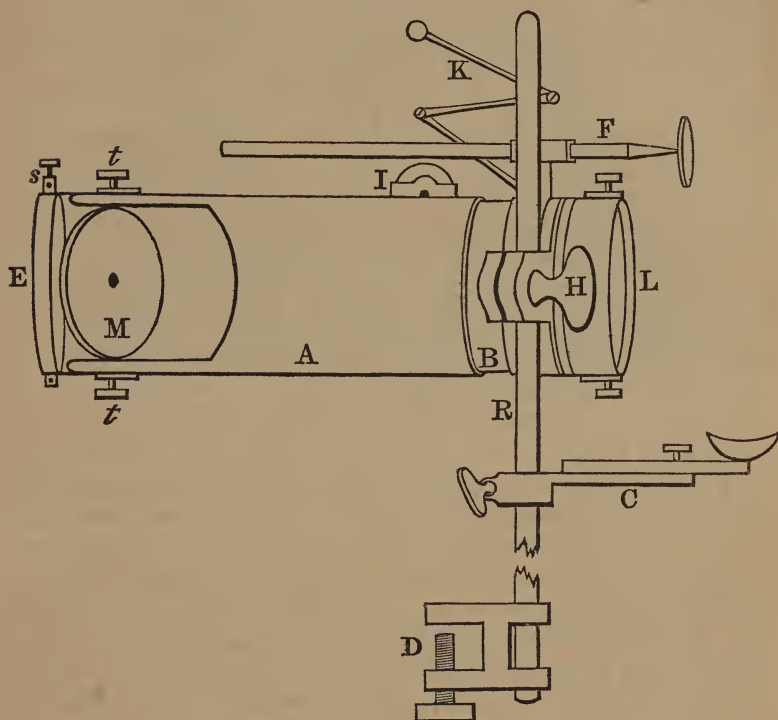
the mirror, M, for holding a convex lens, three of which are contained in the case. When in use the patient's chin rests in the cup, C, and his forehead against the pad, F; the instrument should usually be about two inches from the eye—the focal distance of the lens L, and a lamp placed towards the side, from which rays may fall on M, and so directed then through L into the eye; it will be seen that the anterior extremity remains stationary, while the tube A, carrying the mirror, is movable. The formation and position of the image is the same as that already described and illustrated by Fig. 4. When obtained, the image of the fundus is very clear

and beautiful, and may be readily seen by any number of persons in succession. A camera lucida for drawing purposes may be attached, and also a microscope; its inventor has also constructed an ingenious addition to the instrument, by means of which the fundus of the living eye may be photographed. Professor Follin, whose learned and well-written *Leçons sur l'Exploration de l'Œil* I can confidently recommend to those who are familiar with the French language, has also constructed a fixed ophthalmoscope; but in its optical arrangement, and even in its mechanical construction it appears to differ but slightly from the one just described. I have found the manipulation of Liebreich's instrument rather difficult, and its adjustment often tedious and troublesome, the light being one of the principal sources of trouble; I had a lamp made some years ago which I attached to the upright rod, and which I found to answer much better than the lamp placed beside the instrument; the instrument, too, is liable to shake or tremble from the nature of its support. These and other circumstances led Messrs. Smith and Beck, the eminent opticians and microscope manufacturers, of 31, Cornhill, London, to construct a modification of Liebreich's large ophthalmoscope. This instrument[a] is shown in use in Fig. 8.[b] It consists, like its prototype, of two tubes, one carrying the lens, the other the mirror. These tubes are, however, fixed permanently on an upright stem capable of being raised or lowered by a rack and pinion; to this stem is attached a horizontal arm which carries the lamp. No matter how the instrument may be moved, up or down or from side to side, the flame of the lamp and the mirror will always be on the same level, and always retain their relative positions; the instrument is mounted on a broad board, having three small rollers fixed in its inferior surface, so that it can be freely moved about on a table or any smooth surface; by means of a half-rule joint, secured by a pin close to the base, the board is capable of being turned up against the stem, and the lamp, being brought round to the mirror end, the instrument may be fitted into a small space. As seen in the engraving, a chin-rest supports and steadies the patient's head at any convenient height; a small shade screens the light from the patient's eye, and a small ivory ball at the end of a sliding tube, with a ball and socket joint at its base, serves for fixing the patient's eye at any wished-for position.

[a] Already figured, and described by Dr. Wright in the Number of this Journal for August, 1865.

[b] From a photograph by Allen, 12, Westland-row.

I now employ this in preference to Liebreich's original ophthalmo-
scope, as it is much more easily and quickly adjusted, and affords
an equally good image; even an inexperienced person may, by its

Fig. 8.
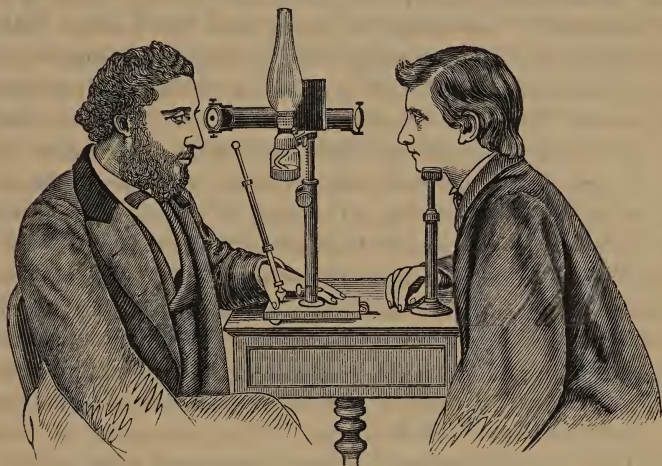
aid, see the fundus of an ordinary eye without any difficulty.   I
have been able also on several occasions to demonstrate satisfactorily
the fundus of my own eye to others by means of this instrument.

Another useful tubular ophthalmoscope, although not nearly so
efficient or practical as the two just described, is that constructed
by my friend Dr. Galezowski of Paris.   This instrument is not
exactly a fixed one, but holds an intermediate place; the ocular end
of the tube projects beyond the object lens, and is so shaped and
padded as to fit over the margin of the patient's orbit, and so to
exclude all light except that transmitted by the ophthalmoscope
mirror; the instrument can be shortened or lengthened in the same
manner as a telescope.

The principal advantage of fixed instruments is, that by their
means the fundus can be satisfactorily demonstrated in a short time
to a large number of observers.   Fixed ophthalmoscopes are, how-
ever, at all times cumbrous and do not afford a satisfactory view of
the peripheral portions of the fundus; hence they are, and probably
will always remain, merely ancillary to the hand ophthalmoscopes.

Ophthalmoscopes in which the mirror is either plane or convex,

and in combination with a double convex lens, are termed *hetero-centric*, and were first devised by Coccius.

The convex lens, which must be of shorter focal length than the negative focus of the convex mirror, is interposed between the flame and the mirror. These ophthalmoscopes are based on the principle of Brücke's experiment, already alluded to (Fig. 2)—*i.e.*, of the eye under observation being accommodated for a different distance than that from which the light actually emanates. Coccius' ophthalmoscope consists of a plane perforated mirror fixed to a handle, attached to which is a jointed arm carrying an upright clip with a convex lens in it: there is a smaller clip on the mirror frame for an ocular lens. Figure 9 may be supposed to be an illustration of this instrument. The rays of light passing through the convex lens fall on the mirror convergently and are reflected by the latter converging into the eye, and form on its fundus a circle of dispersed light. The eye regards the bright surface of the mirror, but in consequence of the action of the convex lens the image of the flame seen in the mirror does not correspond with an actual flame in the position of the reflector, but with one placed a certain distance behind the mirror.

Zehender's ophthalmoscope, shown, the actual size, in Fig. 9,

Fig. 9.
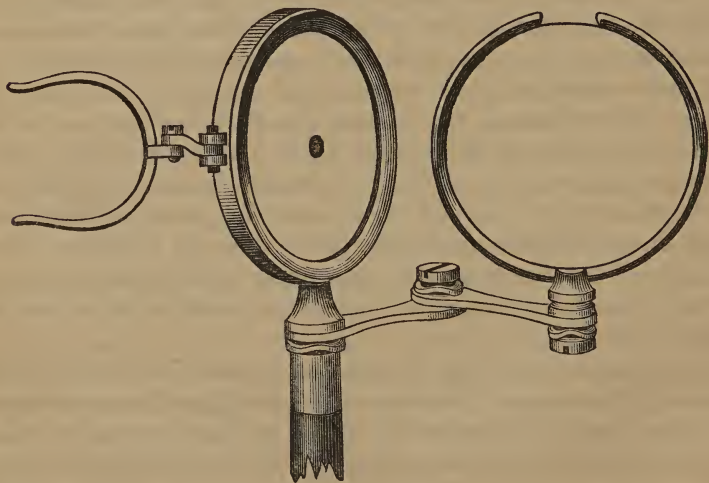
differs from Coccius' only in the mirror, which is convex; in appearance, therefore, these two ophthalmoscopes are at first sight identical.

The lens is 1½″ focus, and the convex mirror has a curvature of 6″ radius. This is a most valuable instrument, and preferable to Coccius'; it affords a larger and better field of illumination than any other ophthalmoscope, and is especially of use in the direct examination. Its manipulation is, however, not very simple, and hence partly it is not such a favourite as Liebreich's hand ophthalmoscope. The light must be at the patient's side, and the lens inclined at such an angle that the rays shall traverse it, and fall on the mirror, from which they are reflected into the eye.

Two other forms of heterocentric ophthalmoscopes deserve mention, but more for their ingenuity than for their practical utility. Ulrich employed two prisms presenting in section the forms of right-angled triangles, with equal containing sides, and fixed them together in such a manner that the hypothenuse of one should be at right angles with that of the other; rays of light falling on the first prism reach its hypothenuse, and are there totally reflected and thus projected into the eye, the fundus of which they illumine; emerging from the eye they strike the hypothenuse of the second prism, and are reflected by it at right angles into the observer's eye.

Another form of ophthalmoscope is that of Hasner, and consists of a convex or concave lens, having one surface silvered, with the exception of a small space in the centre, which acts as a sight-hole. The chief object aimed at in these is the combination in *one* of the reflector and the lens; a biconvex silvered lens acts as a concave mirror—a biconcave silvered lens as a spherical mirror.

The construction of the instruments I have mentioned, and the large variety of kindred ophthalmoscopes, is such that the observer can become cognizant with *one* of his eyes only; hence the errors and deceptions which arise from monocular vision are at all times likely to occur. To rectify this defect Dr. Giraud-Teulon constructed an ophthalmoscope, by means of which binocular vision was secured, and an image of the fundus obtained, in which the parts are seen as they actually exist—in relief, or depressed, or plane. This *binocular ophthalmoscope* is constructed on the principle previously applied in microscopes by Mr. Wenham, and by Nachet, the optician, of Paris—that of employing prisms or rhombs for the purpose of deflecting the rays in part or in whole. Giraud-Teulon employed a glass concave mirror, with a large oval opening in its silvering, and placed behind it two rhombs of crown glass, each representing a double prism of 45°, and capable of effecting total reflection from their inclined surfaces; these rhombs were

placed horizontally behind the mirror, with their apices meeting behind the orifice. The accompanying diagram will serve to explain the nature and principles of this instrument. M represents the concave mirror and L the convex lens, by means of which the reversed aërial image I is formed as with the ordinary ophthalmoscopes; if we take any point in this image we find rays proceeding from it divergently; thus, a pencil of rays is represented in Fig. 10 passing through the orifice *o* in the mirror. Here it meets the

Fig. 10.
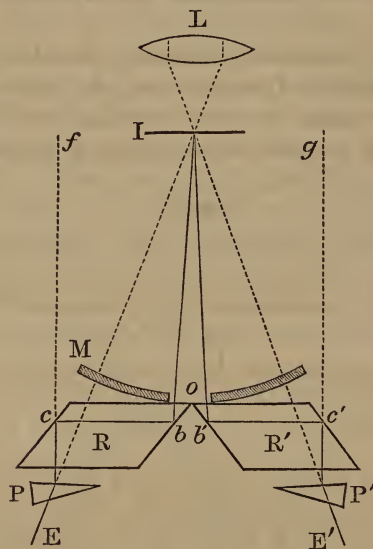
rhombs R and R′, and divides right and left; the ray on the left side is reflected at *b* to *c*, where it is again reflected to P, and emerges from the rhomb; in the same manner the ray on the right side undergoes total double reflection. If an observer now place his eyes in the line of emergence of these rays at E and E′, he will see two images, *f* and *g*; by placing two prisms, P, P′, however, with their bases turned outwards behind the rhombs, the emergent rays are deflected outwards and receive the direction E I, E′ I; the two images are fused into one, and thus both eyes participate in the visual act. As is evident, the width between these emergent rays must correspond to the distance between the examiner's eyes, for otherwise one eye would be excluded from seeing the image, and the instrument would be simply a monocular one. Nachet subsequently

remedied this defect by dividing the right-hand rhomb into two, and making the outer half of it movable, so that the instrument as now made can be adapted to the distance between the eyes of various observers. The rhombs are enclosed in a metal case, in which are spaces for the prisms, four of which are supplied, of various angles; there is an aperture at one side of the frame, into which a handle may be screwed; I frequently use the instrument, however, without the handle, holding it between finger and thumb. The mirror is attached by a universal joint, so that the instrument can be used with the flame either above or to the side of the patient.

My friend Mr. Zachariah Laurence, ophthalmic surgeon to St. Bartholomew's Hospital, Chatham, and the Ophthalmic Hospital, Southwark, has devised a very ingenious modification of this ophthalmoscope; it consists of two reflecting prisms, E, E, placed

Fig. 11.
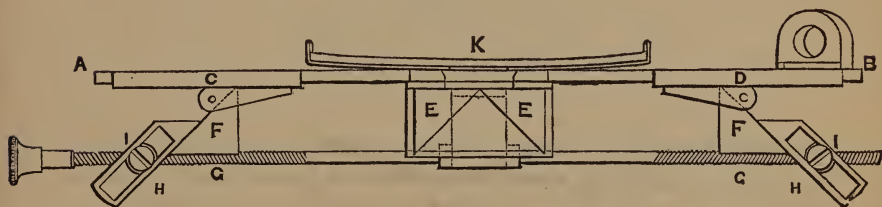
behind the opening in the mirror, K, and two others, F, F, termed oculars, at some distance to the outside; these latter "shift upon an horizontal metallic plate, A B, and can be adjusted to any required inclination by means of a screw G G, carrying the nuts I I, which work in the slots, H H."

" The optical action of the instrument is represented in Fig. 12. O A and O B are the extreme outer rays of a pencil, proceeding from a point (*O*) of the inverted image formed by the ordinary object lens; the ray O B is reflected by the prism B to the prism D, and hence to the observer's right eye placed behind D. Similarly, the ray O A is reflected to the observer's left eye. He then sees *two* images of the fundus oculi. By inclining the ocular prisms (D and C) inwards by the mechanism described above, the two images are fused into *one*."[a]   I am indebted to Mr. Laurence for the loan of these two cuts.

[a] Laurence and Moon's Handy-Book of Ophthalmic Surgery.

The framework and adjusting mechanism is, however, fragile and delicate, and easily injured by careless handling; it is said, however, to prevent the squinting which may occur in the examination

Fig. 12.

with the French instrument, and to produce a clearer image; and its weight is only half that of the other. I cannot speak with confidence on the relative merits of the two, as my experience of Laurence's has been somewhat limited. I have, however, found its manipulation and adjustment difficult, and prefer Nachet's improvement of Giraud-Teulon's ophthalmoscope as a more practical instrument for every-day use; many, however, prefer Mr. Laurence's to Giraud-Teulon's binocular instrument. The manipulation of the French instrument is so easy, and the image afforded by it so beautiful, that I am now beginning to employ this binocular ophthalmoscope in preference even to Liebreich's hand ophthalmoscope. These ophthalmoscopes are most useful in the examination of cases in which an inequality of surface may be suspected; thus, in glaucoma they afford a beautiful and clear image of the cup-like depression of the optic nerve and of the vessels on the sides and in the bottom of the depression.

As is evident, the image of the fundus can be examined only by one individual at a time. Mr. Z. Laurence, has here also brought his great knowledge of the science to bear on the subject, and in 1863 proposed a method whereby the original aërial image may, while

being regarded by the observer, be reflected so as to become visible to a *second* person at the same time; he interposed at right angles between the ordinary reversed image and the ophthalmoscope mirror a plate of glass, with plane parallel surfaces like that used in Helmholtz's first ophthalmoscope; by means of this plate a duplicate image is formed, which may be seen by a second person placed in a certain given position. Giraud-Teulon has suggested an addition whereby even a *third* person may participate in the examination; this is the employment of a plane perforated mirror to reflect the light on to the ophthalmoscope mirror; a lamp is placed near the ophthalmoscope, and is furnished with a chimney, blackened on three-fourths of its circumference; through the remaining clear portion the light proceeds, and falls on the plane perforated mirror, and is reflected by it on to the concave ophthalmoscope mirror, from whence it proceeds to illumine the fundus; the original observer sees the image in the usual way through the ophthalmoscope mirror opening; the second observer sees the reflected image by means of Laurence's plate of glass; and the third places his eye behind the opening in the plane reflecting mirror, and obtains an image from the concave mirror; this third observer is, in fact, almost in the position of a conjugate focus.

Shortly after the establishment of the science and art of ophthalmoscopy Coccius proposed and eventually carried into practice a plan of examination whereby the eye can inspect its own fundus. This consisted in placing close in front of the eye a perforated plane mirror, with its reflecting surface towards the eye, and behind this a flame; the rays passing through the aperture are focussed on the retina; and after emerging from the eye again are made to strike on the mirror close to the perforation, where an image of the illumined portion can be seen; by this means the optic nerve entrance may be seen by the macula lutea of the same eye. Various ingenious *autophthalmoscopes* were subsequently devised; one of the best, though large and complicated, was that of Dr. Heymann, of Dresden. Dr. Giraud-Teulon also constructed one, the principles of which may be learned from the accompanying diagram, copied from the more elaborate figure in his *Précis de la Réfraction et de l'Accommodation de l'Œil*, &c., contained in the supplement to the admirable French translation and annotation of Mackenzie. In this figure the eye A is examining its fellow B; F is the flame, and M a concave perforated mirror, held obliquely before the eye, so that rays from F shall be reflected on to *c*, a plane mirror which is inclined

at such an angle that the rays falling on it are reflected towards
d, a second plane mirror, which will reflect them into the eye B;
a double convex lens of short focus, L, is interposed between

Fig. 13.
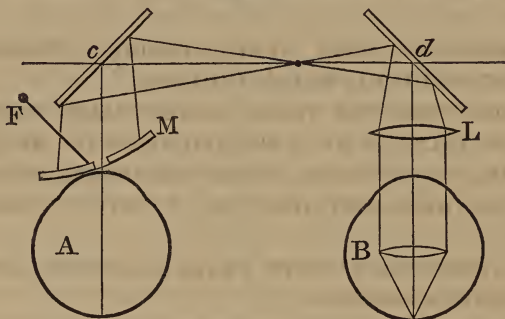
B and *d*, by means of which the usual inverted aërial image is
formed, which will be seen by A apparently situate beyond the
mirror *c*, although absolutely situate between the two mirrors,
near *d*; the erect image may be produced by dispensing with the
lens L and approximating the eyes to the mirrors. By this instru-
ment the whole fundus of one eye may be examined by the other
eye. I should mention that it is necessary to dilate the pupil for
all these various experiments and examinations.

From the foregoing brief and imperfect sketch it will be seen
that the ophthalmoscope is not the result of accident or some happy
thought, nor the creation of some one inventive genius, but that it
owes its origin to deep research and laborious study, to years of
observation, reasoning, induction, and calculation on the part of
many, pre-eminent amongst whom will always stand Helmholtz,
the founder of ophthalmoscopy. The instrument may possibly be
still in its infancy as a means of physical diagnosis, and further
modifications and improvements may yet be carried out which will
render the ophthalmoscope even more perfect and efficient than it
at present undoubtedly is.

Art. IV.— *Notes in Medicine and Surgery.* By Philip Crampton Smyly, M.D., Univ., Dub.; F.R.C.S.I.; L.C.P.I.; Surgeon to the Meath Hospital and County Dublin Infirmary, and to the Institution for Sick Children, Pitt-street.

Case I.—Stricture many years standing; treated by a modification of Mr. Holt's dilator.

Case II.—Stricture ten years; large false passage; the stricture dilated by a modification of Mr. Holt's instrument; no catheter could be subsequently introduced; no bad symptoms; no. 8 introduced 12 days after.

Case III.—Stricture twenty years standing; treated by Maisonneuve's method.

Case IV.—Stricture six years standing; treated by Asprey's plan.

The numerous methods which have of late years been brought before the profession for the dilatation of stricture of the male urethra prove that *the method* has not as yet been attained.

The improvements, however, have been great, and the surgeon and the patient have much to be thankful for—the former for simplicity in manipulation and certainty of doing what is intended, and the latter for the alleviation of suffering and diminished risk to life.

The following cases illustrate some of the most recent and improved methods, and also shows that where one fails another may succeed, and that probably, in time, a combination may be attained which, will be *the instrument*, to supersede all others.

Case I.—Feb. 17th, 1865.—Mr. B. came under observation with an organic stricture of many years standing. About five or six years before he had been treated by the " dilatory" process, so as to admit a No. 7 or 8. The stricture quickly returned, and he suffered from retention more than once. He had to get up several times during the night, and had great difficulty in even partially relieving his bladder.

The smallest catheter could not be passed into the stricture which was situated about the membranous portion of the urethra.

The worm-like bougie of Maisonneuve's instrument was then tried, and evidently passed through the stricture, but it was found

impossible to get the guide to follow it, though one of my colleagues also tried with much patience for some time. I then passed a No. 3, open at the end, down to the stricture, and made gentle pressure on it, and passed through it the bulbed wire (described by me in a former number of this Journal), and gently pushed it forwards through the stricture. This passed with ease into the bladder, the mouth of the stricture being kept on the stretch by the No. 3. The No. 3 was withdrawn, and a No. 2 forced in, which allowed a few drops of water to escape, thus making sure where the wire was. The No. 2 being withdrawn the dilator is introduced, and the tube passed as in Mr. Holt's operation. No. 10 was then introduced and the urine drawn off. The patient walked home after the operation, and had no constitutional disturbance whatever. He called once a week for three weeks to have No. 10 passed, and then once a month until September, 1865. He did not call again for eleven months. No. 10 passed with ease, no instrument having been passed in the meantime.

CASE II.—R. G., aged forty-three, admitted into hospital on 8th of July with retention of urine. The stricture had existed for ten years, and had been frequently treated by gradual dilatation.

On his admission he was in intense pain, the bladder very much distended, and blood was flowing freely from the orifice of the urethra. A medical man had (according to the patient's account) "passed an instrument up to the end, but could find no water." Mr. Carter, resident pupil, gave him repeated doses of muriated tincture of iron, ten drops every twenty minutes; and finding that a large false passage had been made, sent for the surgeon on duty.

I first tried a No. 10 silver catheter, which passed with ease and with a scarcely perceptible deviation, up to the rings, and a small quantity of thick mucus, with a rather strong smell, mixed with blood, dropped from the orifice. It was withdrawn, and a careful examination was made with a No. 1 gum-elastic catheter, bent shortly at the end, and the opening of the stricture was found in the upper wall of the urethra, exactly above the opening of the false passage—an enormously-enlarged prostate having given the first instrument passed, before his admission, a wrong direction. No entrance, however, could be effected. Twenty-five drops of Battley were given, and a warm bath, and the patient was left for an hour. Several small instruments were tried, but without success. At last a No. 1 wax bougie slipped in.

A wire was then secured to the end of it, and one of Wakley's gum-elastic catheters forced over it into the bladder. The bougie was then withdrawn, the long wire substituted for it, and the dilator being introduced, the stricture was dilated and a quantity of urine allowed to escape before withdrawing the instrument. No. 10 catheter, *secundem artem*, was next tried, but no care or patience could induce it to enter the bladder; every time it went straight into the rectum. The patient was ordered full doses of opium and mulled wine. Shortly afterwards (about half an hour) he got upon his knees, and passed about eight ounces of urine in a good stream.

On the fifth day a small abscess formed in the perineum, which contained pus and a little feces, but no urine; incised.

Twelfth day.—The abscess is almost healed; no urine has ever passed through the wound. No. 8 was passed for the first time.

August 10th.—The patient passes his water in as large a stream as ever, and No. 10 passes with ease. He left hospital in good health, fit for work, and was advised to have an instrument passed once a month.

This case is very instructive, showing that an enormously-enlarged prostate, a large false passage, and retention of urine are no hindrance to the successful employment of Mr. Holt's method. It also shows that it is not necessary to pass a catheter immediately or for many days after the operation.

CASE III.—T. C., aged fifty-eight, admitted into hospital 8th of August, '66, with retention of urine. The stricture was of twenty years' standing, following an injury. He had been several times treated by gradual dilatation.

On his admission Mr. Carter found his bladder very much distended. Tried a large catheter, warm bath, &c.

I found a very tight stricture, into which I could not get any catheter, either gum-elastic or metallic. A No. 1 wax bougie passed with considerable difficulty, and allowed a little very ammoniacal urine to escape after it as it was withdrawn. A No. 10 was then introduced, and pressed against the stricture, some urine following it every time it was withdrawn, giving him great relief. The penis was in such a state of inflammation from treatment previous to his admission that cold applications were ordered for it and a warm poultice to the perineum; and vital dilatation to be continued as long as it gave relief.

For three days vital dilatation relieved him so much—although

the bladder never was emptied; in fact, it was distended so much that it could be felt quite up to the umbilicus—that he would not allow anything more to be done. On the night of the 10th great pain came on and high fever. The penis was still so much inflamed that he would scarcely let it be touched. With great difficulty, and assisted by Mr. Porter, the filiform bougie of Maisonneuve was introduced and followed by the grooved staff. The stricture was then cut, and No. 10 india-rubber catheter introduced, and left in.

There was scarcely any bleeding. The urine (much of which had escaped before the incision) was drawn off through the catheter so as not to act on the wound, which would probably have been much irritated by the highly ammoniacal character of the urine. On the third day the patient could withdraw and re-introduce the catheter himself. He left hospital in three weeks quite well. At the end of October he called at the hospital to report himself. No. 10 passed with ease.

CASE IV.—M. T., aged forty-three, 9th July; retention of urine. The stricture followed a running and swelled testicle six years ago. No catheter could be passed, but a No. ½ bougie was introduced, and left in for an hour, after which the bladder was emptied in a small stream. The wax bougie was introduced several times, and then the seaweed. The latter, however, caused considerable constitutional disturbance. The immediate plan was determined upon; but just at the time the description of Mr. Asprey's instrument appeared in the *Lancet*. It seemed so good I resolved to give it a trial.

" The instrument is composed of a No. 1 catheter, having a little cross-bar which serves as a handle, and can be removed when a screw is loosened. When this handle is withdrawn the dilator, having a conical screw at the end, can be passed over the catheter, and worked by the handle. The dilator may be the size of No. 6, 10, or 12, and has a thin metal cover reaching from the handle to the screw, working smoothly over the tube beneath. This is for the purpose of steadying the penis while the screw works in the stricture; it also prevents any abrasion about the anterior portion of the urethra. The bougie is passed over the catheter into the bladder after the dilator is withdrawn, and will be especially applicable when a small dilator has been used; it may be

left in from twelve to forty-eight hours, according to the wish of the operator. It will be seen from the above description that the principal novelty in the instrument is the use of the conical screw for the purpose of dilatation."

Carefully following these directions, I, with some difficulty, introduced the long catheter. This being overcome, the further steps of the operation were very simple; the screw grasped the stricture and dilated with ease, giving very little pain, and taking but a few seconds to pass through it. The gum-elastic was substituted for the dilator, and the long catheter withdrawn. The patient had no constitutional disturbance, and left hospital some weeks after (having been kept to see whether the dilatation was sufficient), No. 10 passing with ease.

These four cases present some points of interest to the practical surgeon, and tend to teach that while we should not be hasty in laying aside what is good, we should not too exclusively confine our attention entirely to one method of treatment.

As a general rule no instrument that I know of is superior to Mr. Holt's; though in some few, either Maisonneuve's or my modification of Mr. Holt's, may succeed when the former has failed at first.

As to the advantages of the immediate plan, nothing more need be said than to refer to Mr. Holt's statistics, drawn from every part of England and Ireland:—" Thus, out of 742 cases we have eleven deaths, and in not one of these cases is it satisfactorily shown that death was *caused* by the extreme measures that are supposed to be exercised by the adoption of the immediate method."

Art. V.—*Sphygmographic Observations on the Pulse of Typhus.* By Thomas Wrigley Grimshaw, A.B., M.B., Ch. M. (Dub.); one of the Physicians to Cork-street Hospital; Lecturer on Materia Medica in Steevens' Hospital.

The pulse of typhus is too familiar, and its variations too well known to the experienced physician, to require any notice from me as to its value as a means of diagnosis, or the guide it affords with regard to the treatment to be followed, especially in the administration of stimulants.

The object of this paper, however, is to draw attention to the results obtained from an extensive series of observations on the typhus pulse conducted in Cork-street Hospital, by the aid of the sphygmograph of Marey.[a]

The physician now daily experiences the benefits derived from the use of instrumental aid in the formation of diagnoses, and in many cases where the information obtained by his unaided senses is quite sufficient for the formation of a correct opinion, these instruments confirm his opinion, and often show results which, although perhaps not of much immediate importance, yet are of considerable scientific value and pathological interest.

It has been with a view of comparing the sphygmograms obtained with Marey's instrument with the sensations conveyed by the pulse to the finger, and of seeing what practical and scientific knowledge may be derived therefrom, that these observations have been undertaken.

The pulse, at the commencement of typhus, is generally found to be quick, without, perhaps, any other change; weakness is then added to the quickness. The pulse is often full and bounding; but a full and bounding pulse is not *always* strong. As to the relation of the pulse to temperature, it will be found that the pulse becomes quicker and weaker, or full and bounding (in certain cases), and of lower tension as the temperature increases; and becomes stronger, less compressible, and frequent, and of higher tension, as the temperature falls. With respect to the eruption of typhus, the variations and state of the pulse have usually a direct connexion with the number and darkness of the spots—*i.e.*, the more numerous and dark the spots, the quicker, weaker, and of lower tension the pulse. Of course there are exceptions to these statements, but as a rule these are the conditions found.

If we look at Figs. 16 and 17, Plate II., we shall see examples of the sphygmogram of health; there may be slight variations from these forms consistent with health, but they are unimportant and easily explained by peculiar conditions of the individual. It will be seen, by taking one of the elevations of the line which represents a single beat of the pulse, that it consists of a nearly vertical up-stroke, and a longer and more oblique down-stroke, interrupted by a small rise, called the dicrotism, or second beat. The up-stroke represents the force of the ventricle in driving the blood into the arteries,

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[a] Physiologie Médicale de la Circulation du Sang. Paris, 1863.

diminished by the amount of resistance to its onward flow. This resistance depends upon—first, the conditions of the aortic valves, which, if healthy, will not offer much obstruction; second, the resistance in the arteries themselves, depending upon the size of the vessels, the quantity of blood contained in them, and the state of their coats; thirdly, the condition of the capillaries as to whether they are dilated or contracted. One of the chief causes which influence the condition of the capillaries is temperature, and it is of special importance to recollect this when investigating the pulse of fevers. The down-stroke represents the time occupied by the flowing away of the blood through the capillaries and veins before the second stroke of the ventricle takes place. The dicrotism is produced by the rebound of the blood from the obstructions produced by the conditions of the arteries and capillaries. It follows, therefore, that the more elastic the arteries the stronger will be the rebound and the better marked the dicrotism. This elasticity can be destroyed in two ways—either by great flaccidity of the coats of the arteries and capillaries, or by increase of tension in the former, depending upon the rigidity of the arterial walls, the fulness of the arteries, and the resistance of the capillaries. We find both these conditions developed during the course of typhus fever.

The principal changes in the form of the typhus pulse seem to depend upon the variations in arterial tension; this will be best explained by reference to Plate III. Fig. 1 may be taken to represent, diagrammatically, the pulse of typhus if the actual tension were at its lowest—so low, that there appears to be no obstruction to the onward flow of the blood. Here we find that the tension of the arteries is so much diminished before the recurrence of the stroke of the ventricle that it offers no resistance to the refilling of the vessels, and the down line of the sphygmogram falls to its lowest. If, however, the tension is increased, as in Fig. 2, which represents the amount of Fig. 1, between lines *a* and *d*, with the elevation joined by horizontal lines, the arteries having still sufficient tension to obstruct the onward flow of the blood until the occurrence of the next ventricular contraction, the first beat is, as it were, caught up by the second; Fig. 3 represents a pulse of still higher tension. A pulse similar to Fig. 1 is comparatively seldom found in typhus (Fig. 5, Plate I.; and Fig. 6, Plate II.), but the form represented in Fig. 2 may be looked upon as that characteristic of the disease during its height. These explanations are necessary as the

sphygmograph has not yet come into such general use as to be familiar to the profession at large.

I have already pointed out that the characteristic pulse of typhus is (as shown by the sphygmograph) that of very low tension, with arteries reduced to the lowest state of flaccidity—and that is just what we might expect from the great weakness and high temperature of the patient during the disease. The weakness of the muscular system, as shown by the patient's loss of power, and the diminution of the first sound of the heart, of course, affects the fibres of the muscular coat of the arteries in the same way as those in other situations, thus diminishing the arterial tension. Again, the high temperature is accompanied by an increase in the calibre of the capillaries, thus also diminishing the arterial tension. In Marey's book, although a great number of pulse writings are delineated, we do not find any showing such a state of flaccidity and utter loss of arterial tension as found in the pulse of typhus. The nearest approach to this condition which Marey has delineated, is that found in puerperal fever.[a] An approach to the typhus form is also delineated by him for erysipelas (erysipele grave), and for pyemia (infection purulente) after amputation. The resemblance between these diseases and typhus as to their adynamic conditions is well known.

In fever practice the physician may usually divide his cases into two classes, the one following a short, the other a long course to recovery. The former are the less, the latter the more severe. In making thermometric observations on typhus, it will be found that the cases may be divided into two classes: those corresponding with the cases following the short course, which attain their maximum temperature on the sixth and seventh day—and those which follow the long course, which attain their maximum on the eighth or ninth day. My attention was first directed to these two classes of cases by Dr. J. Southey Warter, in a private communication. He has since made his observations on this point public in the St. Bartholomew's Hospital Reports.[b] I have examined all my notes of temperature, and found that they corresponded to a great extent with Dr. Warter's observations, though differing in some respects; he finds the seventh and ninth days are the periods of maximum temperature in the classes of cases I have just mentioned; whereas I should

[a] Marey—Circulation du Sang, p. 390, Figs. 102, 103, and 104.
[b] Remarks on the use of the Thermometer in Acute Disease. St. Bartholomew's Hospital Reports, Vol. ii. London, 1866.

rather say the sixth and seventh for the one, and the ninth and tenth days for the other class. In fact, I find the seventh and tenth days are the common days of maxima.[a] Dr. Warter also considers that the ninth day is the commonest for maximum temperature in his cases; now, in mine, I find the maximum is usually attained before the ninth day. This is what might have been expected, as I have remarked elsewhere,[b] that typhus seems to run a more severe course in London than in Dublin; and as the maximum temperature occurring late in the disease corresponds (in my experience, at least) with the more severe cases, we might expect that this difference in results between Dr. Warter's observations and my own would appear, his observations having been all taken in London, and mine in Dublin.

I may also remark, when upon this interesting subject, that when typhus was less fatal in the commencement of last year (1866), the maximum temperature of the cases was attained sooner than when more fatal during the Autumn months. I make these remarks upon the temperature here, because I have found that the variations in the pulse correspond, in the majority of cases, with those in temperature, the higher the temperature, *cœteris paribus*, the lower the tension, and the less marked the dicrotism of the pulse, and *vice versâ*, as before stated.

The pulse characteristic of typhus is, as a rule, best marked in proportion to the darkness of the spots; as the spots appear the pulse gradually loses its natural form, showing a low tension and want of dicrotism; as the spots vanish the tension increases and the dicrotism returns; but after its return, and as the patient approaches convalescence, the dicrotism, in most cases I have observed, again disappears, but from a different cause, which seems to be a contracted and pinched state of the muscular fibres of the arteries, similar to that of the other muscles, which is only too evident, in the appearance of fever convalescents. In Plate I. are delineated the various forms of pulse found in typhus cases running the short course to recovery. Fig. 1 represents the pulse of the

[a] While the author was writing the above Dr. Warter was lying ill of typhus, which disease he had contracted while pursuing further his thermometric observations. In a few days he passed from this world, a martyr to medical science. His loss will be mourned by all who take an interest in the application of exact science to practical medicine.

[b] Temperature of the Body in Fever. Medical Press and Circular, Feb. 21st, 1866.

second day of the disease (of course observations on typhus so early in the disease are not easily obtained). I have only been able to observe two, the result being the form given in Fig. 1, which does not deviate much, except in frequency, from a natural pulse. Fig. 2 represents the state on the third day, showing a greater deviation from the natural form. Fig. 3, the fourth day; Fig. 4, the fifth day; Figs. 5, 6, 7, and 8, represent various forms found on the sixth day, the more common being Figs. 6 and 8; the forms 5 and 7 being found in the more severe cases. Figs. 9, 10, and 11, represent the pulse of the 7th day; Fig. 9 being the most common form. The similarity of the forms on the sixth and seventh days will at once be remarked, as also that of the eighth day, Fig. 12. On the ninth day we usually notice a return of the dicrotism (Fig. 13), as the temperature falls, and the spots begin to disappear, but the low tension still remains; the tension now begins to rise, as seen in Fig. 14, tenth day; Fig. 15, eleventh day; and Fig. 16, twelfth day; the amplitude of the pulse tracing is not always so great on the eleventh day as seen in Fig. 15. In Fig. 17, which corresponds with the thirteenth day, we see the dicrotism again becoming indistinct until the fourteenth day. In Figs. 18 and 19 we find it completely gone; from this time the dicrotism again appears, and the pulse returns gradually to its natural form, as seen in Figs. 20, 21, and 22 (Fig. 22, which is marked in the Plate for day seventeen, does not, I think, exactly represent what probably will be found on further observations to be the average tracing for that day; I think it should be more like Fig. 21). The representations in the Plate are, as nearly as possible, fac-similes of tracings selected as being most typical of the days to which they are stated to correspond. I consider this a preferable mode of drawing up a series of daily sphygmograms to constructing average diagrams for each day. The vertical lines in the Plate are drawn at intervals corresponding with half a second, and are equal to the half-second divisions of my transparent sphygmographic scale.[a]

In Plate III., Figs. 1 to 15 represent a series of sphygmograms taken from a case of typhus belonging to the classes which run the long course, having their maximum temperature on the ninth or tenth day. Fig. 1 corresponds with day eight of the disease; Figs. 2, 3, 4, &c., up to 15, with days 9, 10, 11, &c., up to day 22 respectively. It will be observed that the character of low tension

[a] Med. Press and Circular, Aug. 22nd, 1866.

and absence of dicrotism is present in this series for a much greater
number of days than in that corresponding with the short course
cases represented in Plate I.   At Fig. 4, a peculiar form of pulse
occurs, which I have usually found accompanying head symptoms,
chiefly violent headache, which is generally relieved by leeches to the
temples, and cold applications.   In Fig. 20, Plate II., a specimen is
given of a sphygmogram, also accompanying head symptoms, which
occurred in a large, heavy, plethoric man, with full bounding pulse,
who was in a very peculiar and nearly comatose condition; this case
was relieved by the application of leeches to the temples.   We
sometimes meet with pulses characterised by low tension and but
slightly marked dicrotism, in smart cases of simple continued fever,
as in Figs. 18 and 19, Plate III.   In cases of typhus with *subsultus
tendinum*, it is impossible to get a clear sphygmogram; sometimes
only a slight effect of the beat of the artery can be discovered, as
shown in Fig. 22, Plate II.; or it is quite obscured by the action of
the tendons, as shown in Fig. 21, Plate II.   In cases of well-marked
typhus, without spots, we shall sometimes find that the sphygmo-
gram never loses it dicrotism during the whole course of the disease.
I have not yet observed a similar occurrence in a maculated case.
Does this resemblance between the pulse of unmaculated typhus
and febricula (Figs. 18 and 19, Plate II.) tend to prove any closer
relation than is usually supposed to exist between those two febrile
affections?   The pulse delineated in Plate III., Fig. 4, was very
peculiar, and existed for one day in a case of unmaculated typhus.
I am quite unable to offer an explanation of this form.   I could not
detect any cardiac lesion.

I have not yet had much opportunity of observing the pulse of
typhoid fever; but in the few cases I have observed in this disease, the
most common pulse tracing is that figured by Marey,[a] the dicrotism
being usually well marked.   In a mixed case of typhus and typhoid
I observed the forms figured in Plate III., Figs. 5, 6, and 7.   Fig, 7
shows a near approach to the typhus form.

What practical use can we make of the information offered us by
the sphygmograph in typhus fever?   At present not *very* much,
excepting the advantage we derive from a more accurate and
definite knowledge of the general symptoms of the disease.   As
a guide in treatment, it will be found that the pulse with the
lowest tension, and least developed or absent dicrotism, is the one

[a] Marey—p. 389, Fig. 100.

indicating the largest requirements of stimulants. This, however, is only expressing, in other words, the fact so much relied upon, that the character of the pulse is the guide in the use of stimulants. The character of the pulse of the patient will, in the majority of cases, be as easily estimated by the *tactus eruditus* of the experienced physician as by the sphygmograph. To the inexperienced, however, the sphygmograph will prove a valuable guide in treatment, as its written indications, as observed by others, will constitute a positive standard of comparison, which described sensations cannot possibly do. Perhaps, however the most important practical point is, that the sphygmograph appears to give us more accurate perceptions of the condition of the heart than the finger does. Dr. Stokes has pointed out[a] that the sensations conveyed to the finger, when applied over an artery, do not always indicate the exact condition of the heart, as determined by the stethoscope applied over the chest. From my experience, the sphygmograph gives this information more accurately than the finger.

With regard to prognosis, there is no doubt the gravity of the case is measured by the character of the pulse. I have found that the sphygmograph shows an improvement in the pulse by demonstrating a slight return of its dicrotism, before any sensible improvement could be ascertained by the finger. In one very protracted and severe case particularly, I was able, on the twelfth day, to predict an improvement in the state of the patient from the improved sphygmogram, though all the other symptoms remained the same, and the pulse to the finger presented no appreciable alteration.

The observations upon which my remarks are founded were nearly all taken in Cork-street Hospital, the majority of the patients observed being under my own care, but many of them under that of my colleagues, Drs. Kennedy and Mason, to whom I have to return my best thanks for the facilities they have always afforded me in the pursuit of scientific enquiry. I followed about sixty cases throughout the course of their disease, the observations upon which were checked by many casual ones upon other cases. At the time the sphygmograms were taken, notes were also taken of the sensations conveyed by the pulse to the finger; the temperature in the axilla and rate of respiration were recorded as well as the other

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[a] Stokes on Disease of the Heart. 1854. P. 134; and Dublin Journal of Medical Science, 1839, p. 15.

T.W. Grimshaw.

T.W.Grimshaw.

Fig 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

T.W. Grimshaw.
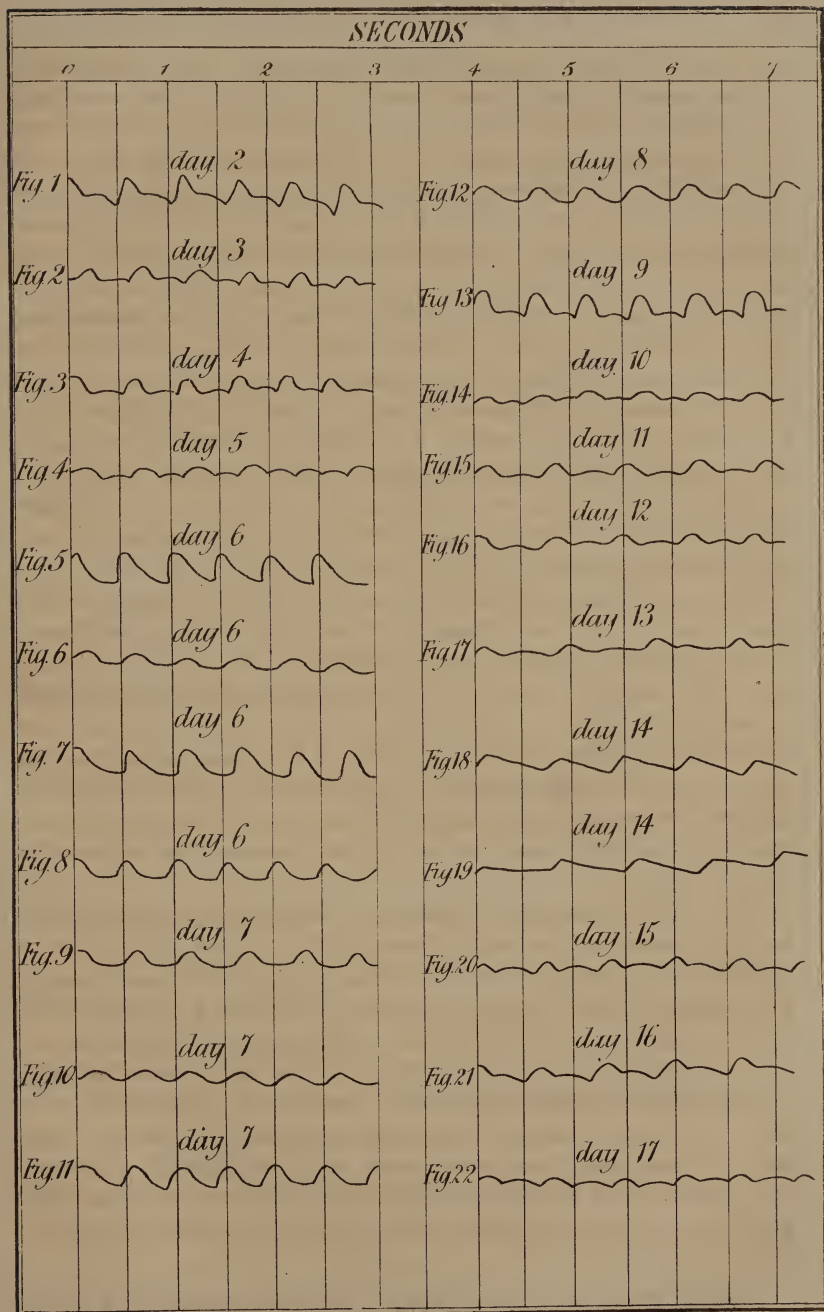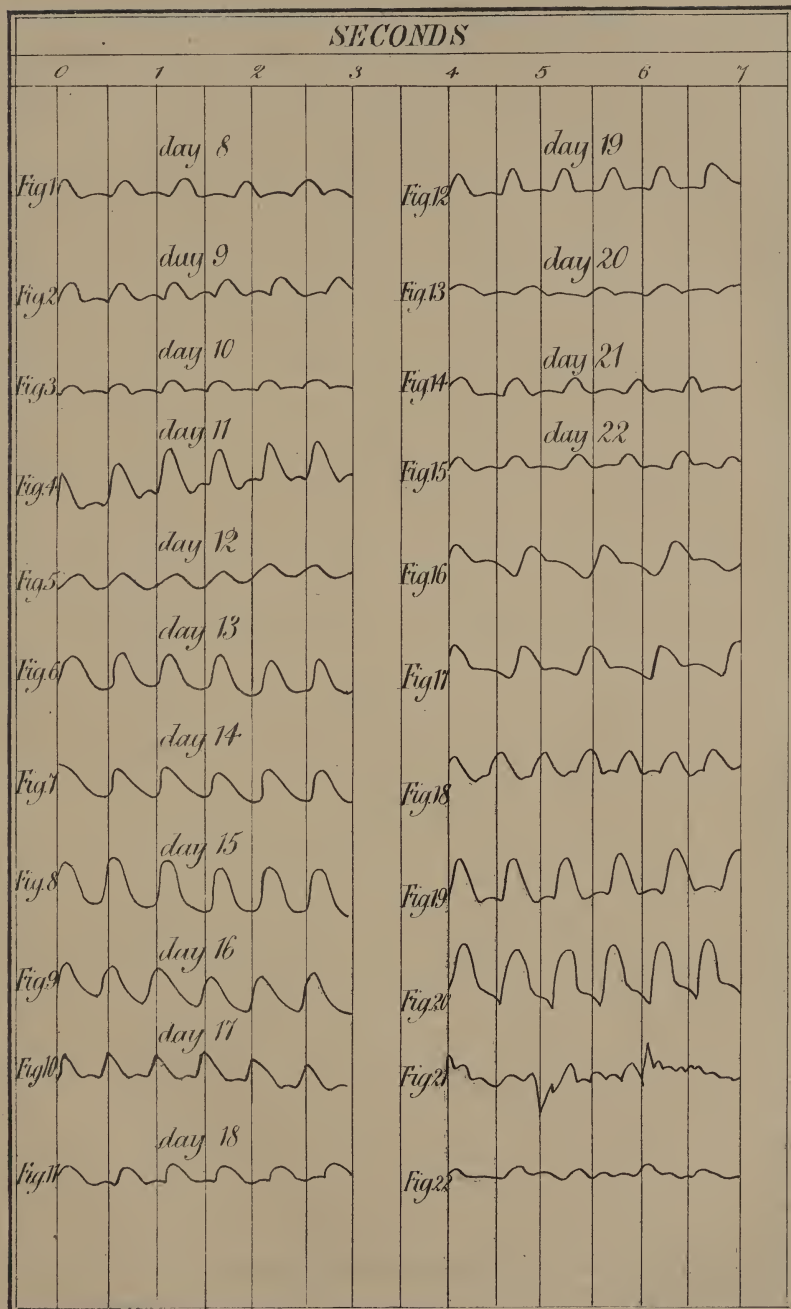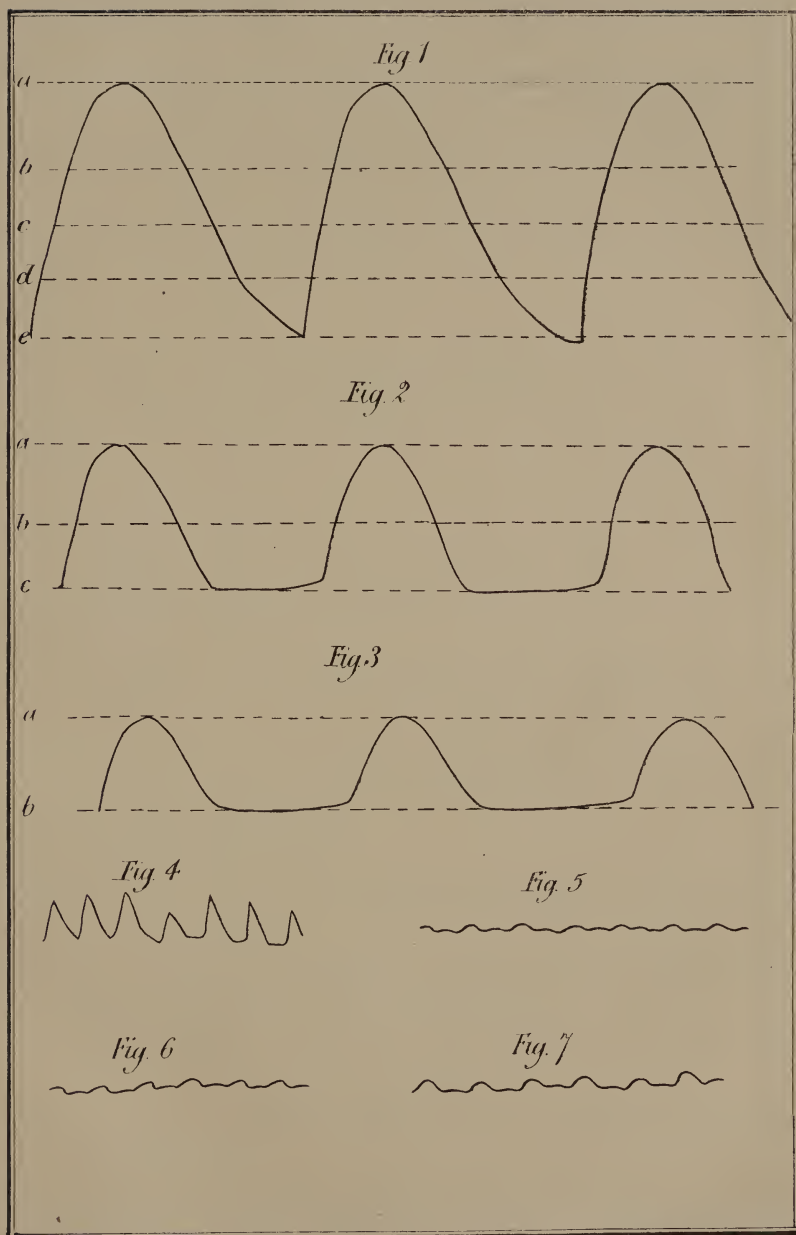
conditions of the patient.   Altogether, about 3,000 observations of pulse, respiration, and temperature, have been made by me, which I think must be considered sufficient foundation for the foregoing remarks.   I hope they will be of interest to the profession, and eventually add, in some degree at least, to our knowledge of the symptomatology and treatment of typhus fever.

Explanation of Plate I.   Pulse of Typhus running a Short Course to Recovery.
Fig. 1.—Pulse of 2nd day of Typhus.
Fig. 2.   „   3rd   „   „
Fig. 3.   „   4th   „   „
Fig. 4.   „   5th   „   „
Figs. 5, 6, 7 and 8.—Pulses of 7th day of Typhus.
Figs. 9, 10, 11, and 12.—Pulses of 8th day of typhus.
Fig. 13.—Pulse of 9th day of typhus.
Fig. 14.   „   10th   „   „
Fig. 15.   „   11th   „   „
Fig. 16.   „   12th   „   „
Fig. 17.   „   13th   „   „
Figs. 18 and 19.—Pulse of 14th day of Typhus.
Fig. 20.—Pulse of 15th day of Typhus.
Fig. 21.   „   16th   „   „
Fig. 22.—Pulse of 17th day of Typhus, running the short course, but not an average specimen ; the tracing should be more like Fig. 21.

Explanation of Plate II.
Figs. 1 to 15.—Pulse illustrative of a case running the long course to recovery, the record commencing on the 8th day.
Fig. 16.—Healthy female pulse.
Fig. 17.—Healthy male pulse.
Figs. 18 and 19.—Pulses of severe simple fever, at the height of the disease.
Fig. 20.—Pulse found often to accompany severe headache, easily relieved by leeching.
Fig. 21.—Tracing produced during an attempt to take a sphygmogram from a patient with severe *subsultus tendinum.*
Fig. 22.—Tracing produced by the combined action of the pulse, and moderate *subsultus tendinum.*

Explanation of Plate III.
Figs. 1, 2, and 3.—Diagrams explanatory of the variations in tension of the typhus pulse.
Fig. 4.—A remarkable form of pulse found in one case of typhus for one day.
Figs. 5, 6, and 7.—Forms of pulse found in cases of mixed typhus and typhoid fever.

Art. VI.—*On Polypus of the Uterus; with Description of a Modification of the Ecraseur for the Removal of Intra-uterine Growths.* By Lombe Atthill, M.D., Dubl. ; Fellow of the King and Queen's College of Physicians in Ireland; Examiner in Midwifery, Queen's University; and ex-Assistant Physician, Rotundo Hospital.

Dr. Marion Sims, in a paper published in *The Lancet* in Nov., 1864, remarking, with great propriety, on the advantages arising from the use of the sponge tent in cases of intra-uterine disease, says:—" That before their introduction, if we suspected, from the rational symptoms, the existence of an intra-uterine polypus, we could only wait from month to month—sometimes from year to year—for it to grow and force its way into the vagina, before we could interfere surgically for its removal; but now we no longer let our patients bleed till they become bloodless and dropsical, but we ferret out at once the source of the mischief and remove it from its once secure hiding place." " This," he adds, " is a great advance in uterine surgery, and no man of twenty or thirty years' experience can look back on the days of Ergot and Gooch's canulæ, and contrast them with the present time of sponge tents and the ecraseur, without a thrill of delight at the progress of our noble calling." I quote the foregoing passage because it is a graphic description of the change which has taken place in the treatment of uterine disease; for, even in my own experience, though falling short of even the twenty years, I have seen a patient die from the effects of the hemorrhage caused by an intra-uterine polypus, which we knew existed but could not reach. I think, however, that Dr. Sims over-estimates the value of the ecraseur, or, perhaps, more correctly, under-estimates the difficulty of its application in some of these cases. The following brief details of the history of a patient who was placed under my care during the past Summer, by my friend Dr. Head, will, I think, prove interesting, as offering an example of a life saved by the use of the sponge tent and ligature, while, at the same time, it tends to illustrate the difficulty of adjusting the chain of the ecraseur round an intra-uterine polypus.

She was an unmarried woman, aged about forty-five years, and when I saw her was very weak, greatly emaciated, and presenting a remarkably unhealthy appearance; so much so as to impress the observer with the idea that she must be labouring under malignant

disease. She suffered incessantly from sickness of the stomach, and for weeks past had never been free from hemorrhage She stated that formerly she had been a very healthy woman, but that some eighteen months ago she began to perceive the catamenia, which hitherto had been in all respects natural, to become much more profuse; then that they returned at short and irregular intervals; and finally, as already stated, that she was never free from a sanguineous discharge. During the whole of this lengthened period she suffered but little pain, though at intervals severe paroxysms came on, caused evidently by uterine contractions, for they always terminated in the expulsion of clots, after which she experienced relief. She resided in the country, and there had tried various remedies, mainly, I believe, tonics and astringents, which had been prescribed for her relief; but as they failed to check the hemorrhage, she came to town for further advice.

On making a vaginal examination I was surprised to find that the uterus was free from malignant disease. It was low in the pelvis, greatly but evenly enlarged, globular in shape, and very firm to the touch; the cervix was completely obliterated, and the os closed, admitting with difficulty the point of a uterine sound, which, however, once introduced, passed freely into the cavity of the uterus to the depth of nearly five inches; the existence of an intra-uterine tumour was beyond doubt, but whether it was a fibrous tumour or polypus had yet to be ascertained. I believed it would prove to be a polypus, basing this opinion on the fact that the uterus was so evenly enlarged, and also on the absence of pain, which, as far as my experience goes, is a nearly universal accompaniment of fibrous tumours of the uterus. As the patient was in a very debilitated state, and losing blood rapidly, it was absolutely necessary to act promptly. I therefore proceeded without delay to dilate the os, and, after a little difficulty, succeeded in introducing into it a small sponge tent; this, on its removal, was found to have opened the os, so as to admit the tip of the finger; a larger tent was at once introduced, followed, on its removal, by one still larger, which completed the dilatation of the os to the size of a crown piece; this process occupied two days. The finger could now be introduced freely into the uterus and swept round the tumour, the attachment of which was very high up and to the right side. The diagnosis of polypus being thus verified, its immediate removal was decided on. Dr. Beatty and Dr. Kidd, who saw the case with me, assisting in operation. At the suggestion

of Dr. Kidd, who kindly lent me the instrument, I determined to try Dr. Marion Sims' porte chaine ecraseur. The first step in the operation was to endeavour to draw the polypus partially through the dilated os; for this purpose a double hook was fixed in it, but the pedicle was so thick and dense that it was quite impossible to accomplish this; the hook, however, as it served to steady the uterus, was not removed till after the operation was completed; the end of the ecraseur was now introduced into the uterus, and I succeeded, without difficulty, in carrying the chain to the fundus, and consequently beyond the attachment of the polypus; but the moment I began to expand the spring blades the difficulty commenced, for the uterus, probably from its never having been impregnated, was most unyielding; and though I twice succeeded in expanding the blades, the chain on each occasion became displaced, and slipped off the spring blades, and I consequently failed to secure the polypus. I now made an effort to use an ordinary wire ecraseur, carrying the wire up by means of a gum-elastic catheter; this plan, however, failed also, and as it was evident that the patient would speedily sink from the effect of the hemorrhage unless we could remove the polypus, I had recourse to the canulæ of Gooch, and with them, though not without considerable difficulty, succeeded in passing a strong ligature of double whip-cord round the pedicle; once, however, applied it never slipped; and having been moderately tightened, was secured; the patient was greatly exhausted after the operation; some vomiting followed, which was checked by ice, and a tolerable night's rest was secured by an opiate enema. On the following and succeeding days the ligature was tightened, morning and evening; this was most satisfactorily effected by means of a small winch, which Dr. Beatty has most ingeniously adapted to the end of the connecting rod of the canulæ, and which, when sufficiently tightened, is secured by a screw; this worked admirably, and saved much trouble.

Five days elapsed before the ligature cut through the pedicle, and even then the polypus remained in utero. I succeeded, however, in extracting it with a pair of small forceps; it was then about the size of a large egg, but originally must have been much greater; in structure it proved to be purely fibrous.

The woman recovered slowly, but after the lapse of three weeks was able to return home convalescent.

This case, though presenting nothing very unusual, is instructive. We may consider the result eminently satisfactory; for, without

doubt, this woman would have died had the removal of the polypus been delayed but a few days longer: but the means by which its removal was accomplished were not what we would desire; for though the dilatation of the os was rapidly effected, my failure in applying, first, Dr. Marion Sims' ecraseur, and subsequently an ordinary wire one, compelled me. to have recourse to the old and objectionable method of the ligature, an operation only justified by the urgency of the case—an operation always disagreeable, and often followed by dangerous and even fatal consequences. In the present instance not only was the inseparable accompaniment of a very fetid discharge present, but I greatly dreaded the occurrence of blood-poisoning or some low form of peritonitis, as the patient had more than one well-marked rigor, and vomiting returned almost daily. I therefore bitterly regretted my failure in applying Dr. Marion Sims' instrument; perhaps the failure was due to my own want of skill, but certainly I did not give up the attempt till I was perfectly satisfied that snare the polypus with that instrument, I could not. The instrument, though a very ingenious one, is complicated, and in a case like the present, where the vagina was very narrow and the uterus extremely rigid and completely filled by a very firm tumour, its application became simply impossible. These circumstances led me to consider whether a less complicated instrument could not be devised, which would unite to the great advantages attending the rapid action of the ecraseur the facility of applying the ligature afforded by the canulæ of Gooch: and it occurred to me that if the extremity of the ecraseur were modified, so as to allow the ordinary canula of Gooch to pass through it, we would have a simple and efficient instrument. I have had an ecraseur, so modified, made by Weiss, and append a woodcut to exemplify its application. With the canulæ *a a*, a wire rope, *b b*, of considerable strength, can be. passed round the pedicle
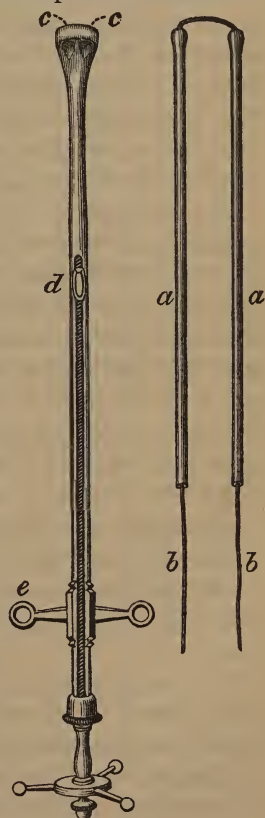
of the polypus; the canulæ are then to be passed through the opening *c c* in the extremity of the ecraseur : the ecraseur is then to be pushed up, guided by the canulæ, till it comes in contact with the pedicle of the polypus, filling the place exactly that the connecting rod of Gooch did in his instrument; the canulæ can then be entirely withdrawn, and the wire rope, being attached to the ecraseur at *e* and *d*, the operation is completed, as if we were using an ordinary wire ecraseur. If the engraving given here be compared with that in Dr. Gooch's work on *Diseases of Women*, it will at once appear that it differs from his instrument only in the substitution of an ecraseur for the connecting rod, but a great advantage is obtained in the power conferred by the ecraseur of enabling us to complete the operation at once, and thereby save the patient from the great dangers often following the application of the ligature in the old way : and I think if this simple modification of the ecraseur enables us to succeed in even but a moderate proportion of cases it will be no slight gain, and will prove a useful addition to our obstetric instruments. I am well aware that cases will be met with which will resist the action of the wire rope, or break it; but they are rare; and if a strong twisted wire rope be used where the pedicle seems likely to offer much resistance to the action of the instrument, they will prove still more so. In conclusion, I wish to add that I do not desire to depreciate the merits of Dr. Marion Sims' ingenious instrument; but it is too complicated, and I feel that it is inapplicable to many cases. Dr. Braxton Hicks' instrument, too, though possessing the advantage of simplicity, will often fail in carrying the wire rope round the pedicle if seated at a distance from the os, and will always be difficult of application. I think that the modification I have suggested, which in reality is the adaptation of the canulæ of Gooch to the ecraseur, will be found superior, at least in facility of application, to any yet made.

The following case illustrates how little inconvenience may, under certain circumstances, be caused by even large polypii—how slight may be the symptoms, and how nature sometimes effects a cure :—

I was requested by a nursetender to visit a woman, the wife of a cabman, who, she informed me, had been confined under her care three days previously, after a natural labour, of a strong well-nourished child. I found her to be a healthy robust woman, aged about thirty. She stated that when in the ninth week of this her

third pregnancy, having exerted herself to raise a heavy weight, she "felt something to give way inside" her, and immediately after perceived a tumour to protrude through the vulva; smart hemorrhage followed, but this soon ceased, and the tumour receded.

During the remainder of her pregnancy she continued to enjoy good health, and experienced no inconvenience unless she were to take a long walk, or make any unusual exertion, in either of which cases the tumour would again partially protrude, but it receded again on her lying down; there was also, on one or two occasions, slight hemorrhage. The midwife who attended her in her confinement, which appeared to have been rapid and easy, did not perceive anything unusual till, on the third day after delivery, she found a large mass protruding through the vulva—when, being alarmed, she came for me. I found, just as she described, a soft mass, of considerable size, lying in and nearly filling the vagina. At first I thought that was a portion of the placenta which had been left behind, it resembled it so much in appearance, but a careful examination proved it to be a polypus, which could be easily traced up to its attachment by a long and slender pedicle to the posterior lip of the os uteri; some hemorrhage followed the examination. As the woman was so recently delivered I thought it better to defer for a short time the removal of this polypus.

On visiting her again, after the lapse of two days, I found the pedicle shrivelled up, and the polypus itself beginning to decompose. I, therefore, divided the pedicle with a pair of scissors, at a distance of about half an inch from the os, and removed the mass, which proved to be a soft mucous polypus. The woman recovered without a bad symptom.

ART. VII.—*A Comparison between the Accidents which have Occurred in Scutch Mills, and in Factories Subject to Government Inspection, as they have come under my Notice during the Eight Years of my Connexion with the County Down Infirmary.* By JOHN K. MACONCHY, M.B., F.R.C.S.I.

IN the November number of the *Dublin Quarterly Journal* Dr. Babington, of the Londonderry Infirmary, has given some valuable information on the subject of the frequency of accidents occurring in scutch mills. My present object is to give further evidence on

this matter, and, if possible, aid in drawing attention to it, as I have no doubt there would be a diminution in the number and severity of accidents in these mills if they were subject, as far as practicable, to the same rules and inspection as factories.

Many of the accidents which have come under my notice have arisen from circumstances which improved machinery and due caution in management would obviate.

The worst source of injury and loss of life has been the use of the old wooden rollers, through which the flax has to pass several times; they are served from a narrow table, to which the flax is returned after passing through, and from which it is again started, so that the hands of the operative serving them are in frequent and close proximity to danger. The patent rollers used in most new mills are much smaller, capable of being completely covered, served from a table of over three feet long, and the flax has only to pass through once, and is delivered at the opposite end to its entrance, so that the operative serving them need never be in danger; and, owing to the small size and the fencing, even if he were caught, could not be so seriously injured.

Other sources of accident, such as carelessness in not giving due notice when the machinery is about being put in motion, want of proper fencing, and imperfection in the machinery, would come properly under the cognizance of a Government Inspector.

Apropos of imperfect machinery. I lately visited an old mill in which the handle for putting the rollers out of gear was held to a beam of wood by a holdfast; the removal of the holdfast occupied at least two minutes; and when removed the handle itself would not consent to stir; had a finger been caught in these rollers the arm would have been drawn in to the shoulders before they could have been stopped.

It often happens in these mills that the owners of flax, or their servants, help in the rolling of it, and not being accustomed to machinery, they are peculiarly liable to accident. Any means of preventing this practice would be most desirable.

In order to estimate the comparative frequency of accidents arising from the two sources mentioned in the heading of this paper, I have endeavoured to arrive at some approximation to the numbers employed in each, and for how much of the year they are so employed in this district. This infirmary receives all the accidents of consequence occurring in four factories, which employ from 2,700 to to 3,000 operatives constantly. In the same district there are now,

as far as I can ascertain, fifty-nine scutch mills, but at the beginning of the eight years of which I treat there were hardly thirty; at present the mills could employ about 2,500, but so many as this, are never employed even in the busiest part of the scutching season, which lasts three or four months, the work then gradually decreases, and for five or six months most of the mills are idle, so that I am sure I over-estimate the numbers employed in scutch mills on the average of the whole year at a quarter of those employed in the four factories. Were accidents in proportion to employment there would be at least four from the factories for one from the mills. How different the real proportion is will be seen at once by the table subjoined:—

	Factories.	Mills.
Fatal injuries,	0	6
Injuries involving loss of limb,	2	7
Injuries involving serious and permanent deterioration of a limb,	3	3

Even this table does not show fully the disproportion, for reference to the list of accidents will show a disproportion in severity which cannot be sufficiently expressed in a tabular form.

During the eight years the factories have occasioned the loss of two forearms and seriously impaired three arms, whereas, in the same time, the scutch mills have killed six people, seven survive minus a limb, and others with seriously impaired arms. Twelve of the sixteen mill accidents are more severe than any of the five factory accidents. The following accidents are all on the books of the infirmary, except two, in which the injuries were too quickly fatal for the removal of the patient.

Factory Accidents.

1. Mary Maguiness,   } Amputation of } From revolving
2. Matthew Campbell, } forearm, } wheels.
3. John Bell, partial amputation of hand, }
4. Charles Walsh,   } One arm seriously and } Caught in the
5. Edward M'Cartan, } permanently deteriorated, } hackles.

Scutch Mill Accidents.

1. Both arms caught in the rollers, and chest crushed against them. This man died almost immediately.

2. The left arm caught in rollers; ribs of that side broken; died the day after the accident.

3. Robert Smith, aged fifteen, admitted Jan. 19, 1859. Left arm drawn in by rollers; soft parts lacerated; blood-vessels and nerves torn; bones comminuted; at least two ribs, left side, broken; amputation at the shoulder joint; in a few hours the side became emphysematous where the ribs were broken. Died the day after admission.

4. Richard Hanlon, aged thirty, admitted 30th September, 1863. Right arm drawn in up to shoulders by rollers; no bone broken, only a slight wound in the upper and inner part of the arm; brachial artery not pulsating; arm evidently infiltrated with blood; cold; sensation destroyed. He positively refused to submit to operation till the next day; acute mortification set in during the night, extending to the wall of the chest. Died 4th of October.

5. James Bothwell, aged sixteen, admitted 2nd November, 1863. Right arm drawn in by rollers; humerus broken close below articular head; axillary artery and plexus of nerves torn; thoracic side of axilla bruised and torn; amputation at shoulder joint, but a clean wound could not be left; wound became sloughy; third day secondary hemorrhage, which was arrested, but he never recovered this second loss of blood, and died on 13th November, 1863. Were I called on to treat a similar case again, viz., amputation at the shoulder necessary, and some sloughing in the wound inevitable, my first step would be ligature of the third stage of the subclavian artery, trusting to the branches of the thyroid axis for the vitality of the wound and flap, and having the ligatured part of the artery as far as possible from the probable sloughing.

6. James Ringland, aged seventeen, admitted 20th January, 1865. Was cleaning behind handles when the machinery was put in motion; one leg and thigh torn, and bones broken in many places; the other less injured; body crushed; never recovered from collapse. Died 21st January, 1865.

7. Joseph Cleland, aged nineteen, admitted 1st December, 1863. Hand and wrist injured by wheels; amputation of forearm. Recovery.

8. Eliza Harbison, aged fifty, admitted 30th September, 1863. Left arm drawn in by rollers to above elbow; would not consent to operation; more than six months after forearm dropped off.

9. Isabella Coulter, aged sixteen, admitted 23rd December, 1863. Not a regular mill operative, but helped in the rolling; caught by

rollers; right arm drawn in to near shoulder; amputation at shoulder-joint. Rapid recovery.

10 James Fisher, aged twenty-nine, admitted 2nd November, 1864. Both arms drawn in by rollers; right arm amputated above elbow; left saved; now a tolerably useful limb; has recently been a patient of the infirmary, with lumbar abscess.

11. Edward Rogan, aged thirty, admitted 3rd February, 1865 Left arm drawn in by rollers; muscles, vessels, nerves, and bones all injured; amputation at shoulder-joint. Recovery.

In this case, it being the left arm, I operated by dissecting up the flap, and think it a more tedious proceeding, more troublesome in securing the arteries that surround the neck of the humerus, and certainly clumsy-looking surgery.

I would prefer to make the flap standing at the outside of the patient's arm, transfixing is so much easier, and more quickly performed.

12. John Hinds, aged forty-three, admitted 22nd March, 1865. This was a most peculiar accident. The right arm was drawn in by the rollers to near the shoulder; *no bone was broken, nor was there the slightest solution of continuity of the skin,* but sensation was destroyed; no pulsation to be felt in any artery below the axilla; the limb was cold, and slightly discoloured.

Every effort was made to try and convince the man of the danger and uselessness of trying to keep the limb; but when he saw no wound, and knew no bone was broken, he would not be convinced. So, exactly one year after, the forearm bones came off. He has a humerus covered with discoloured skin, devoid of sensation, and still largely ulcerated. I saw him a few days ago, so can answer for the state a year and nine months after the accident.

13. Pat M'Conville, aged sixteen, admitted 17th October, 1865. Caught in the metal wheels which move rollers; right arm injured to above elbow; artery torn; amputation in the upper third of arm. Recovery.

14. John Armstrong, aged fifty-four, admitted 22nd May, 1861. Caught in rollers; comminuted fractures of arm and forearm. Recovered, with a permanently damaged limb.

15 Pat. Gribben, aged thirty-four, admitted 31st October, 1862. A farm labourer, not a regular mill operative. Caught in rollers; vessels and nerves escaped; limb saved, but permanently deteriorated.

16. Thomas Martin, aged twenty-nine, admitted 18th November, 1865. Back of the hand struck by handles; extensor tendons destroyed; a permanently deteriorated limb.

There have been many injuries of less severity than the foregoing from both sources, and there is not the same disproportion between them that there is in the severe accidents; this I attribute to the want of fencing in the scutch mills. When machinery is well fenced, a finger or two may be caught, and the tops injured or lost, but the whole arm cannot be drawn in, and the more fatal forms of accident are avoided.

I believe reasons exist why the present Factory Act could not well be extended to scutch mills, at least without some modifications; yet if, in other localities where flax is much grown, accidents are as numerous as here, I think there are sufficient reasons for subjecting them to close inspection, forcing owners to adopt new and safe machinery, and use every effort in their power to prevent carelessness and exclude amateur operatives.

Art. VIII.—*Observations on the Comparative Advantages of Affording Obstetric Attendance on Poor Women in Lying-in Hospitals and in their own Homes.* By DENIS PHELAN, M.R.C.S., London; late P. L. Medical and General Inspector.

It seems, for many reasons, desirable to ascertain whether, in large cities and towns, such as London, Dublin, Glasgow, &c., society is as much benefited by affording obstetric attendance in lying-in or other hospitals to such poor women as wish to be confined in them as if it be afforded in their own residences—that is, in the residences of those who have a home in which they can be conveniently attended. Of course, for such exceptional cases as require careful medical watching or professional treatment the hospital is necessary.

The subject may be considered under these heads:—1. Which mode of attendance is the least expensive, assuming each to be efficient; and 2, by which is there less loss of life of mothers and children?

In respect to the comparative expense of hospital and of home attendance, we have the following data.

The Reports of the Board of Superintendence of Dublin Hospitals show that, in the seven years ended March, 1864, 9,039 labour cases, and 1,272 patients affected with chronic female diseases, were admitted into the Dublin Rotundo Lying-in Hospital, and that the expenditure amounted to £16,018, which sum (excluding the cost of buildings and furnishing such buildings) was an average cost of 31s. per head.   During these seven years 617 extern labour cases were attended from the hospital, for which the expense is not given, probably because there is no officer paid for that particular duty, the cost of which is mixed up with the general expenditure.

During these seven years 3,496 labour cases, and 244 chronic patients were admitted into the Coombe Lying-in Hospital in Dublin, the expenditure being £5,600, which is an average cost of 29s. 10d. per head; but in this is included the expenditure on a dispensary for women and children, for which a medical officer is specially employed and paid.   During that period 4,473 home labour cases were attended by the hospital medical officers and pupils.

If the cost per head be calculated on the totals attended in and out of hospital, that on the 10,928 cases attended by the Rotundo would average 29s. 3d. per head, and on the 8,210 attended by the Coombe, 13s. 6d. per head.   This disparity of cost arises from the greater number of externs attended by the Coombe than by the Rotundo.

The expenditure of the London Royal Maternity Charity is stated to average £1,830 yearly, and the number of women to be 3,500 annually, which is an average cost per head of 10s. 6d.   The attendance by this institution is exclusively extern.

I am not aware of any other published data to show the cost of home attendance on lying-in women.   As that by the Rotundo Hospital is almost exclusively intern, the cost, of course, is proportionately high; the mixed system adopted by the Coombe reduces the average cost to a moderate sum, whilst the exclusively home attendance in the London Maternity is still less expensive.

MORTALITY OF MOTHERS IN CHILD-BED.

1. The Registrar-General reports that, in the year 1861, 886 died of metria (puerperal fever) in England and Wales, and 2,109 of the accidents of child-birth; in 1862, 940 died of metria, 2,137 of the *accidents;* and in 1863 the mortality was 1,115 from the former, and 2,483 from the latter.   These returns show that the mortality from

metria in the first year was one in 781 births; in the second, one in 758; and in the third, one in 654. The average of the three years was one in 726. The mortality from the accidents of childbirth was one in 330 births in the first year, one in 333 in the second, and one in 255 in the third. The average of the three years was one in 306.

In 1861 the mortality from both causes was one in 235 births; in 1862, one in 231; and in 1863, one in 202; the average of the three years being in the proportion of one death to 223 births.

2. In the first of these years, 162 died of metria and 234 of the accidents, in London; in the second, 190 died of the one, and 245 of the other; and in the third year, 222 and 227 died. From metria the mortality in these respective years was one in 610 births, one in 531, and one in 464; and from the accidents, one in 424, one in 414, and one in 450. The mortality from both causes was in the proportion of one death to 234 births in the three years; in first as one to 250, in the second one to 232, and in the third one to 228.

3. In 27 cities and towns of the largest populations and trade in England, whose population is about 3,546,000, 162 died of metria and 427 from the accidents of child-bed in 1862; and in 1863 153 died of the former and 395 of the latter. The mortality from metria in 1862 was one in 761 births, in 1863 one in 800. From the accidents of child-birth it was one in 290 and one in 312. From both causes it was in the proportion of one to 209 births in 1863, one to 225 in 1863.

4. The Registrar-General for Scotland reports that 203 died of metria in that country, in 1861, and 130 in 1862, being in the proportion of one to 500 births in the former years, of one to 800 in the latter. From the accidents 308 died in 1861, and 305 in 1862, being one in 345 births in each year. From both causes the mortality was one in 207 births in the first year, one in 243 in the second.

5. In 1861 the mortality from metria was 84, and in 1862 it amounted to 49, in seven of the most populous and trading cities and towns in Scotland, whose population is about 886,000; and that from the accidents of child-birth was 108 in the first year and 98 in the second. From both causes the mortality averaged 178 annually, and was in the proportion of one to 170 births. In Glasgow 57 died of metria, in the two years, and 85 of the accidents, which was one in 227 births annually.

There is yet no published account of the mortality in Ireland from these two causes, but the Registrar-General has published lists of it for the years 1864 and 1865, in the registration district of Dublin, which includes Kingstown, Blackrock, Donnybrook and Rathmines; and, as my object is to compare the mortality in large and dense populations, the returns for the Dublin district will answer that purpose.

6. The population of that district is 314,409. In these two years there were 72 deaths from metria and 48 from child-birth—total, 120. The births averaged 7,952 annually; the mortality from both causes was one to $132\frac{1}{2}$ births; from metria one in 221, from the accidents one in 331.

The mortality of mothers in child-bed in lying-in and other hospitals is now to be considered.

1. Mr. Simon, the medical officer of the English Privy Council, gives the following information in the *Sixth Report on Public Health*:—" In Paris there are, besides one large lying-in hospital (La Maison d'Accouchement), in all the general hospitals beds (numbering from 14 to 52) set apart for the delivery of females. In the year 1862 2,204 births took place in the Lying-in Hospital; and 166, or one in $13\frac{1}{4}$, died; 4,764 were confined in the other eleven Parisian hospitals; and 310, or one in $15\frac{1}{3}$, died. The mortality from metria was in the proportion of one to $15\frac{2}{7}$ births in the Lying-in Hospital; in the other hospitals, as one to $18\frac{1}{2}$.

2. " In the fifteen years ended 1859, 8,036 women were delivered in the St. Petersburgh Midwives' Institution, of whom 306, or one in $26\frac{2}{7}$, died. In these 15 years 25,711 labour cases were admitted into the hospitals of that city, and 1,117 of them died in child-bed, which was one in 22.

3. " During the 24 years ended 1856, 4,960 deliveries took place in the London York-road Hospital, and 146, or one in 31, died; in two of these years 188 women were delivered in it, and 34 died, which was a mortality of one in $5\frac{1}{2}$ births. The principal cause of death was puerperal fever. Puerperal fever has occurred in this institution since 1856; the last outbreak was connected with scarlet fever, in 1861. The place had to be closed for three or four months.

4. " During five years 10,000 deliveries were effected in the London metropolitan hospitals, of whom 129, or one in $77\frac{1}{2}$, died."

5. " On summing up the results of several continental lying-in hospitals (the years are not stated), Dr. Barnes found that, out of 14,253 deliveries, 247 women died, which was one in $56\frac{3}{4}$."

6. We learn from Sir William Wilde's valuable work on the Vienna institutions that the lying-in hospital there admitted 4,453 women in one year, and that 179, or one in 25, died—a mortality which he attributes to puerperal fever. " This affection," he observes, " makes fearful ravages in the hospital annually. It is not considered by the medical men as infectious, and therefore no precaution is ever taken to prevent its spread, by cleaning, whitewashing, or shutting up wards where it has particularly prevailed for any length of time; nay, more, I have seen a newly-delivered woman placed in a bed, yet scarcely cold, in which a death from puerperal fever had taken place not two hours before."

This institution, though the most celebrated and extensive of its kind in Europe, must, under such management, be a curse, instead of a blessing, to the Viennese. In the nine years ended 1838, it admitted 32,679 non-paying labour cases; the mortality is not given; but if it were, an average of one in 25, as in 1838, it is likely that, at least, 1,200 women must have died in it more than would have died had they been attended at home, or had there been no lying-in hospital in Vienna.

7. " In the years 1861 and 1862 705 women were confined in the Glasgow Lying-in Hospital, and 13, or one in $54\frac{1}{2}$, died. This hospital contains only 24 beds."

8. " During the seven years ending 1862, 1,092 labour cases were conducted in the Liverpool Lying-in Hospital, and eleven proved fatal to the mother," which was a mortality of one in 99. " This hospital is small, clean, and apparently well conducted, and is intended for the reception of a small number of cases of diseases of the female organs, and for the delivery of *respectable* married females."

9. The Dublin Rotundo Hospital Statistical Table shows that 8,224 births took place in that institution in the seven years ended 1864, and that 252 mothers died, which is one in $32\frac{2}{5}$ births. During these seven years 3,142 deliveries took place in the Coombe Lying-in Hospital, and 45, or one in 70, died.

MORTALITY OF MOTHERS UNDER HOME ATTENDANCE.

1. Mr. Simon states, on the authority of Dr. Barnes, that, during five years, 18,751 women were delivered by the Royal Maternity Charity in London, and that of these 56, or one in 334, died.

2. Mr. Simon also cites the authority of Dr. Hugenberger of

St. Petersburg, that in 15 years 207,582 women were delivered in that city at their own homes, with a mortality of 1,453 mothers, which was one in 143.

3. In the years 1861 and 1862, 729 women were attended at home from the Glasgow Lying-in Hospital, and 10, or one in 73, died.

4. During the seven years ended 1864, 617 women were attended from the Dublin Rotundo Hospital, and ten, or one in 62, died.

5. During the same seven years the Coombe medical officers attended 4,473 at their homes, with the loss of 20 mothers, or one in 223.

Since the foregoing was written I have seen the article, " Etude sur les Maternites," in the October number of the *Annales d' Hygiéne Publique*, in which the editor reviews a work by Dr. Leon Le Fort, and shows that he and others have lately published a vast mass of carefully-collected returns to prove three propositions.

" Considered altogether, Dr. Leon Le Fort's work is composed of three *essential* parts, or propositions.

"1. The women who are confined in the hospitals and maternities not only die there in much greater numbers, but die in a quite unusual proportion compared with those who are confined in their own dwellings.

" 2. The cause of this frightful mortality must be attributed to puerperal fever, *and it is by contagion that this destructive scourge exerts its ravages.*

" 3. It is absolutely necessary to take serious hygienic measures; and if the malady cannot be prevented from breaking out, it is, however, possible to oppose barriers to it, and to say:—' Thou shalt go no further.' "

Amongst the voluminous returns referred to by the editor are the following :—

" Of 888,312 women confined in maternities or in hospitals, 30,954 died; and of 934,781 deliveries, effected in the towns, 4,405 were followed by death. The mortality was, in the first case, one woman out of 29 confined; in the second case, it was only one out of 212."

These returns appear to confirm Mr. Simon's statement that "the

mortality in lying-in hospitals is almost invariably greater than among women delivered at their own homes;" and a careful inquiry respecting the cause or causes of this certain relative mortality will show that it is more immediately attributable to the greater occurrence of puerperal fever, and of other contagious febrile diseases in hospitals, than in home attendance.

It would be reasonable to ask, how it happens that a greater relative proportion of women die in lying-in and other hospitals, in which great attention is paid to ventilation and other hygienic conditions, and over which highly educated and experienced medical men preside, than die at home, in residences many of which are comparatively wretched and ill-ventilated, and with far less comfort to carry them through their confinement. Until recently the cause, or causes, or the extent of their effect, was not, I believe, well known. The fact is thus accounted for by Mr. Simon in the before-mentioned report. He observes:—" The admission or exclusion of infectious diseases forms a very important item in regulating the mortality of hospitals.

" There are certain affections, especially eruptive fevers, which are capable of being conveyed from the infected to the healthy by the breath, or other emanations or secretions of the body, and whenever or wherever (except under certain conditions) anyone comes under their influence, he runs the risk of being infected by them; all this, of course, is a mere truism, but it is important to enunciate it clearly. Such a spread of disease proves, of course, the presence of a poison; it shows, what everyone would admit, that *the admission of any infectious case involves a risk; it raises the question as to the propriety of exposing anyone to such a risk who comes to a hospital for cure.*

" All surgeons attached to large metropolitan hospitals are aware that their operation cases are apt to be occasionally carried off by the supervention of erysipelas, pyemia, or hospital gangrene, *or some allied unhealthy form of inflammation.* They know well that they may go weeks, months, and even years, without losing a patient from any of the above causes, though occasionally an isolated case may occur, and that now and then some one of these secondary diseases prevails for a time, endemically, attacking operation case after operation case, until the ward, or wards, which have been the seat of the disease, have been emptied, and thoroughly ventilated and cleansed; and that, *after apparently ample precautions of this kind have been carried into effect, the re-occupation of the*

emptied beds may be the signal for the renewal of the disease. It is generally considered that the occurrence of these secondary forms of disease, and especially their frequent reccurrence, or their prevalence in an endemic form, is an indication of unhealthiness in the hospital or in that part of it in which they manifest themselves. There can be little doubt that the development and spread of these diseases are associated with defective hygienic conditions, but there can be little doubt that these sanitary defects are not the sole cause of the outbreak of these unfortunate complications; for it seems to be a tolerably well ascertained fact that, in places where they become endemic, there must be (not merely to allow of their spreading, but in order to beget them), an accumulation of open sores, producing what is termed a *traumatic* atmosphere.

" We have, finally, to say a few words with regard to the results of midwifery practice in wards in hospitals specially devoted to the reception of pregnant women. The lying-in hospitals of England and Scotland are, for the most part, small and insignificant institutions; indeed, the only lying-in hospital of much importance in Great Britain is the Rotundo Hospital, Dublin. In this admirable institution—admirable alike for its construction and its arrangements—the results of midwifery practice are not unsatisfactory. Though occasional cases of puerperal fever are not uncommon in the Rotundo, epidemic outbreaks are comparatively rare; and when they do occur, are regarded as due rather to some epidemic influence than to spread by contagion. So strongly is this opinion held that *sporadic cases arising in the hospital are never (except when they are about to die) separated from the other labour cases; and it is asserted that no ill consequences whatever ensue from this practice.* In the epidemic referred to (that of 1861-2, in which the mortality was 8·3 per cent., 46 were attacked with puerperal fever, and 28 died. and eight were attacked with scarlet fever, and seven died) there was evidently some close connexion between the prevalence of puerperal fever and the prevalence of scarlatina. The outbreak, therefore, furnishes an example of the well-established fact that scarlet fever, typhus, and other exanthemata are not only peculiarly apt to attack puerperal women exposed to their contagious influences, but prove peculiarly fatal to them, and that these poisons constitute a fruitful source of contagious forms of the so-called puerperal fever." Mr. Simon continues:—" But though in Dublin it seems to be questioned, there can, we believe, be little doubt that puerperal women have many points of resemblance to operation

cases, and that the presence of a *traumatic atmosphere*, such as is created by the accumulation of large numbers of women recently confined, is attended with many of the dangers which certainly attend a similar atmosphere in a surgical ward. We do not mean that the traumatic atmosphere in itself creates disease, but we believe that puerperal women are peculiarly susceptible to those poisonous influences which, among surgical patients, produce erysipelas, pyemia, and the like; and that when those poisonous influences are present, the traumatic atmosphere favours their injurious operation. It need scarcely be said that a very large proportion of puerperal fever cases are pyemic, originating in some inflammatory condition of the uterine walls, and that it has been over and over again proved that this particular form of the disease may be conveyed by the medical attendants, by the nurses, and by dressings, and the like.

" Now, the presence in any institution of the former variety of disease, that relating to exanthemata, must depend on the entrance into that institution of some form of exanthematous poison. It is an accident, therefore, which can only be occasional, but which can scarcely fail to occasionally occur; *and when it does occur, in large institutions specially, is extremely likely to produce grievous consequence.*

" It is certain that this disease (puerperal fever), like pyemia, in surgical wards, becomes at times, and from similar causes, *endemic* in hospitals, and that decided measures are then needed for its eradication. There is no doubt that sporadic cases of puerperal pyemia occur in other British maternity hospitals besides the Rotundo; but these institutions are on so small a scale, and can be so soon emptied, when any sign of danger manifests itself, that anything amounting numerically to an epidemic ought scarcely to arise; still, we believe that all the London maternity hospitals have had, from the prevalence of puerperal fever, to be closed on more than one occasion. The experience of the York-road Lying-in Hospital, more, however, formerly than of late years, has been particularly unsatisfactory. In Paris it is a striking fact, that the results are (for almost every hospital) analogous, in many respects, to those of surgical operations. The appended tables show how high the mortality among lying-in women is universally in the Paris hospitals, and, at the same time, how very largely this high mortality depends on ' puerperal fever and puerperal peritonitis,' which terms, doubtless, signify (since deaths from eruptive fevers are distinguished) essentially pyemia.

" It appears, however, that the mortality in lying-in hospitals is almost invariably greater than that amongst women delivered at their own houses.   A mortality of between one and two per cent. is, in ordinary years, that occurring in the Rotundo.   In small and well-conducted establishments, like those of Liverpool and Glasgow, the mortality is usually about the same; and, on the whole, that of the lying-in hospitals in London is probably not very different.   A death-rate of one or two per cent. may not appear very alarming, but when we know that the per centage of deaths out of hospital is considerably less than this, often not exceeding 0·3, or even 0·2 (one in 300, or one in 200), we are led to suspect that the excess of mortality above these numbers may depend upon hospital influences.

" Whenever surgical cases presenting open sores are received, hospital diseases, such as erysipelas, pyemia, and phagedena, are liable to arise.   The liability of these affections to originate and to spread is considerably influenced by concentration of traumatic atmosphere.

" Puerperal women are exposed, in hospitals, to two dangers. Like patients after surgical operations, and for the same reasons, they are peculiarly susceptible to the influences of those conditions on which pyemia and erysipelas depend; they are also highly susceptible to the poison of contagious fevers.

" The accumulation of puerperal women in a ward creates a traumatic atmosphere, with all its risks, and furnishes material on which the poison of an infectious disease, accidentally introduced, acts with terrible violence.   *But labour is a natural process, and only in a comparatively small number of cases calls for the special exercise of skill in nursing or medical treatment.   There are, therefore, generally, in the case of puerperal women, none of those special objects to be gained by becoming the inmates of a lying-in charity, which the diseased and maimed seek by admission into general hospitals.*"

These statements and opinions appear to be fully confirmed by an account which Dr. Telford, one of the Rotundo Hospital assistants, gives, in the October number of the *Dublin Medical Press*, in reference to the mortality caused by puerperal fever in that institution in the month of April last.   He states:—" The epidemic of puerperal fever which visited the Lying-in Hospital in April last is deserving of notice.   The suddenness of its invasion,

the extreme rapidity with which most of the cases terminated, and the great mortality in the numbers attacked—16 dying out of 17— mark this outbreak as one of very unusual virulence. The hospital, for the time of the year, was in a fair state of health. During the month of March there were 117 cases delivered, and five died." " On the 23rd of April a patient, who had been delivered on the 8th inst., died. On the evening of the 23rd a woman, who had been confined the day before, had a rigor, and died next day. In the same ward with the last patient were four others, three of whom were attacked, all died, none of them living more than twelve hours after the first symptom.

" Thus, out of a total of 25 patients who were in the lying-in wards at the time of the outbreak, seventeen were attacked and sixteen died. We had a patient in the chronic ward suffering from membranous dysmenorrhea; she was carried off in three days also."

The hospital was then closed, and " was whitewashed, fumigated, and painted. Since then we had 145 deliveries, and only one death, from placenta previa."

Dr. Telford continues:—" A deal has been written as to whether puerperal fever is infectious or not, and very opposite opinions held by some of our most distinguished physicians. In its epidemic form we believe that almost every patient brought within its influence will be attacked, but that does not prove it to be in-fectious, as one can hardly call it infection where such a number of patients are attacked simultaneously. It is *the custom in this hospital to have patients suffering from this disease in the same ward with others; in fact, we never remove them until we anticipate a fatal termination*, and then more for the purpose of saving the other patients' feelings than to guard against infection. Still we never find the disease communicated from one to the other.

" The poison which produces puerperal fever has been supposed by some to be identical with that which produces erysipelas. This was, to a certain extent, borne out by one of our wardmaids, who had been in constant attendance on the patients, being attacked with erysipelas, of which she died. I may also state that erysipelas was very prevalent in the city at the same time, and, in some of the surgical hospitals, *the surgeons were obliged to defer any operation proceedings.*"

Whilst giving Dr. Telford full credit for his valuable paper, and for his belief in the opinions that are therein expressed, I hope a few remarks on some passages in it will not be considered uncourteous or inconsistent with the subject. I would ask how can a lying-in hospital be considered in a state of fair health if the five deaths that occurred in it in the previous month, or the most of them, died of puerperal fever? Dr. Telford doubts that the disease was caused by infection; which opinion appears to be that of the medical authorities of the hospital, as they " leave patients suffering from puerperal fever in the same ward with others, and never remove them till they anticipate a fatal result." Then, as it may be inferred that some were affected in March, the disease cannot have been sporadic (which is defined in Dunglisson's Medical Dictionary to be "diseases which supervene indifferently in every season and situation, from *accidental* causes, and independently of any *epidemic or contagious* influences"); and if it be neither contagious nor sporadic, it must have been endemic (or owing to some peculiarity in the situation or locality). But it is difficult to understand how an institution which is truly described as "admirable in construction and in its arrangements," and in which great attention is paid to cleanliness, ventilation, &c., can have been so very malarious that seventeen lying-in women, separated as they must have been in different wards, would become so suddenly affected with one particular febrile disease; and, as I have frequently gone through this fine institution, officially and otherwise, and have always found it in a satisfactory state, I cannot believe that the puerperal fever described by Dr. Telford was either sporadic or endemic. This is a question of so much importance in the safe conducting of lying-in hospitals, that if Mr. Simon's opinion, as well as that of " some of our most distinguished physicians," as admitted by Dr. Telford, that puerperal fever is contagious, be well founded, it follows that if an infectious disease spreads in the wards of the Rotundo, or any other hospital, there is a *risk* that others coming under its influence will be affected with it; and, therefore, " that the question is raised as to the propriety of exposing anyone to such a risk who comes to an hospital for cure," or merely to be confined, as it may be assumed was the case with the parties described by Dr. Telford.

In reference to the admissions into lying-in hospitals, Mr. Simon observes:—" It seems to us, from considerations which are discussed in the section on the " Health of Hospitals," that *they are undesirable,* and that the appropriation of wards to the reception of

puerperal women in general hospitals is especially to be condemned. It is, of course, possible that certain circumstances may (*as is said to be the case in Dublin*) render a lying-in hospital, like a work-house, a matter of necessity; and it is also possible that certain cases in which special dangers are to be apprehended at the time of delivery, would be safer in an institution where they could be more carefully watched than at home; but these are exceptional cases, and do not furnish any valid argument against the general opinion we venture to express."

.It would seem, from the words ("as is said to be the case in Dublin") in the above quotation, that Dr. Bristow and Mr. Holmes, who in 1863 examined and reported to Mr. Simon on the Dublin hospitals, understood that extensive hospital accommodation for the delivery of lying-in women was a *necessity* in Dublin, and that without it much loss of life and other serious consequences must result. It might have been difficult to confute that view before the workhouses were established, as there were no reliable data to show what amount of accommodation would have been sufficient; but now, when every woman of ill character, and every woman who has no fixed residence, can get admission as a pauper into the workhouse, that *necessity* does not seem to exist, beyond the exceptional classes before alluded to.

The large number of deliveries that have taken place in the Rotundo has been adverted to; and it would seem, from an observation by Mr. Simon, that Dr. Bristow and Mr. Holmes understood that circumstance to be owing to the poverty of the women of the working classes in Dublin, which poverty rendered them unable to meet the expense attendant on their lying-in. But it cannot be reasonably supposed that one-third, or one-fourth, of the child-bearing women of Dublin were, or are, so poor as to be unable to bear the ordinary expenses of their confinement. In the seven years of Dr. Labatt's mastership, for instance, the enormous number of 21,867, or more than 3,000 yearly, were delivered in the Rotundo, which was more than one-third of all the births of rich and poor in Dublin; and though latterly the number is much less, at least one-seventh of all the deliveries in Dublin have taken place in the Rotundo in the last ten years. Every intern pupil of the hospital knows that many, in sufficiently comfortable circumstances to meet the expense of their lying-in, go into that institution, partly to be under good professional treatment, but partly, also, to save the

expense of their confinement, which they are enabled to effect by the facility with which they are admitted into it, as will be perceived from the following evidence, given by the then master, Dr. Shekleton, before the House of Commons Committee on Dublin Hospitals, in 1854 :—

Q. " Do you admit every woman who presents herself at the door for admission?"   *A.* " Yes, if she come in labour to the gate, there is no question asked."

Q. " Do you ever ask any questions with respect to women, if they come more than once, to ascertain whether they really are objects of charity?"   *A.* " No."

Q. " If they were to come half-a-dozen times would you make any enquiry?"   *A.* " We never refuse a woman admission; *we have no power to do so.*"

Q. " Whether she is poor or not?"   *A.* " No."

Q. " You take it for granted that she is poor?"   *A.* " Yes."

Q. " There is no check upon a woman coming into the hospital and delivered of an illegitimate child?"   *A.* " None whatever."

Q. " Do you ever take any steps to inquire into the condition or life of the husband?"   *A.* " Never: R. C. clergymen generally recommend the patients."

Q. " Is there no means of checking a woman coming into the hospital regularly to be delivered of an illegitimate child?" *A.* " None whatever."

Q. " The same woman might come in six times in a dozen years and be delivered of an illegitimate child?"   *A.* " Certainly."

Q. " If you discovered that, would you refuse her admission?" *A.* " No; we have no power of refusal."[a]

Q. " Do you ever refuse admission to a woman who comes, in labour, to the hospital?"   *A.* " Never."

Q. " Is the hospital restricted to married women?"   *A.* " We never make inquiries; they all pass as married women whether they have husbands or not."

During my pupilage in the Rotundo, in 1813, many of this non-paying class were admitted, whose appearance and dress indicated no necessity for gratuitous hospital treatment; and many, too, died in it of puerperal fever which, it is very likely, most

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[a] The hospital charter appears to give full authority to the governors to make a by-law to meet the case.

of them might have escaped had they been confined at home.   Dr Shekleton's evidence shows that the abandoned, as well as the virtuous, could take advantage of the hospital, and that no rule or by-law existed to check the repeated admissions of women of the former class, and I am not aware that any now exists.   It is true, as before observed, that when, and long after, the hospital was founded there was no workhouse to which that immoral class could have recourse when about to be confined; but for many years before that evidence was given they were admissible into all the Irish workhouses as paupers.[a]   The *necessity*, therefore, that existed for the admission of this immoral class had long ceased in 1854, and their admission cannot, or could not, be fairly deemed an act of necessity nor of charity.   Viewing the subject in a moral sense, it appears likely that such women would be more checked in their career by being compelled to have recourse to the workhouse, where they would have less, though still sufficient, comforts than if received into a superior institution where the stigma of their habits is much concealed.   And in reference to the charter of the Rotundo Hospital, it is evident that it was not intended that the hospital should be available for the class in question.   The words are:—
"In many parts of our said kingdom, and especially in the city and suburbs of Dublin, there are always many poor and distressed women great with child, who, by the sickness, death, absence, neglect, or extreme poverty, *of their husbands*, wholly depend on their own daily work for even common necessaries, and are, on lying-in, frequently both themselves and their infants lost, not only by the difficulty of obtaining the care of some skilful person, but even through the want of such covering, lodging, and sustenance as are necessary for women in that condition, many instances of which could be produced, especially in the case of wives and widows of soldiers and sailors of our army and navy."

These words, I think, appear to imply that the Rotundo was intended to receive one class chiefly—such *wives* and widows as, from any of the circumstances so minutely described in the charter, are unable to provide the necessaries attendant on their confinement. I believe that, on the contrary, many who are fully able to meet such expense are admitted.   I have known the wives of servants,

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[a] During the six years ended 1865, 16,310 births took place in the Irish workhouses, and 124 women, or one in 133, died.   The mortality was highest in 1863—one in 90 ; and lowest in 1864—one in 190.

both husband and wife having good wages, and money to spare, to avail themselves of the Rotundo; and I infer, from the words of the charter, that neither such parties, nor those of the immoral class, were intended to be relieved in it, unless when an exceptional case might require careful medical watching and professional treatment.

Many doubt that it is judicious to give too great facilities to women of this comparatively comfortable class to avail themselves of a public charity, as it is found that it also gives them the habit of craving from their more wealthy neighbours that with which, by thrift, they could readily supply themselves, and that it lessens that spirit of independence and foresight which it is desirable to encourage.

Another view of this subject appears to require the serious consideration of lying-in women, and of the authorities of hospitals into which they are admitted, of which, perhaps no better illustration could be given than is afforded by Dr. Telford's letter. He states:—" Thus, out of a total of twenty-five patients who were in the lying-in wards at the time of the outbreak, seventeen were attacked, and sixteen died." If, suppose eight of these sixteen could have afforded to meet the moderate expense of being confined at home, under professional attendance from one of the lying-in hospitals, or by the dispensary medical officers, the whole of them, or the greater part, would probably have been saved; for, I find by the Registrar-General's Return, that the mortality from metria, for the five weeks ended 5th of May, was only seventeen, whereas that returned by Dr. Telford is sixteen. The Rotundo was closed on the 23rd April; and there is no return of deaths from puerperal fever by the Registrar-General in the week ended 5th May. It would seem, therefore, that only one died of that disease in the registration district outside the Rotundo—at least, if the returns made by the several registrars be correct.

When loss of life is concerned, another illustration of the caution with which those who can afford the cost of home confinement (unless for some exceptional reason) should desire to be confined in hospitals. During the three first years of Dr. Labatt's mastership in the Rotundo, 10,248 deliveries took place in it, and only fifty-seven women, or one in 180, died; but in the next four years of his office, 252 died out 11,628, which was one in 46. This higher mortality must have been chiefly caused by puerperal and other fevers; for it is not likely that an able midwifery practitioner

would have had more deaths from the accidents of childbirth in the last years of his mastership than in the early years; but the contrary, as his experience had much increased. Now, if we only assume that about the half of that 11,628 were of the comfortable class that could afford to be confined at home, and had been confined there, eighty-six mothers would have been saved, even though the mortality were one in 150; but even if it were so high as one per cent., sixty-eight lives would have been saved. Several similar instances could be given.

We have the high authority of Drs. Sinclair and Johnston, who were assistants in the Rotundo, and who have published a valuable work on practical midwifery, that even those who have had natural deliveries were not safe from puerperal fever. They state that sixty-seven mothers died in the Rotundo, in their time, "whose deliveries had been purely natural," and that forty-one of them died of puerperal fever. Had these been confined at home, some might, perhaps, have had that disease; but it is not likely that so many would; and, as their labours were natural, they did not go to hospital on account of malformations, or from apprehension of difficult labours.

The high mortality in lying-in and other hospitals, and its frequent recurrence, will be perceived by the Table at page 92, which shows that in the Rotundo it has been very low in some years, and again very high; it has occasionally continued low for two, three, four, five, and six years, and again become continuously high for five years. It will be seen that in some years the mortality ranged from one in 145 deliveries to one in 233; and that in several others it was from one in 52 to one in 14. These marked extremes are scarcely explicable, unless on the supposition of the recurrence of puerperal or other febrile diseases in the hospital; as it is not likely that under the able practitioners who attend it, and have always done so, such a high mortality would have been caused year after year by the accidents of childbirth, such as ruptured uterus, hemorrhage, &c., &c., which usually influence the mortality of lying-in women.

Applying the foregoing returns and observations to the Rotundo Lying-in Hospital, as it is the most commodious in Great Britain or Ireland, and has the most ample and certain funds, the question arises, what causes this occasional, but frequent high mortality in an institution in which cleanliness and ventilation are carefully observed, the comforts of the patients well attended to, and over

which very able and eminent midwifery practitioners preside? All these elements in the condition of the hospital would naturally indicate a certain low mortality, at least as low as that which takes place outside, where these comforts and medical superintendence are not so much available. The answer would appear to be, that the chief cause is that, which is stated by Mr. Simon and Dr. Le Fort to produce a higher mortality of parturient women in lying-in and other large hospitals, namely, the occasional introduction into them of contagious febrile diseases, particularly scarlatina and typhus fever, and thus, though indirectly, puerperal fever is produced. The introduction of such contagious diseases into the Rotundo is the more likely to take place, as fever usually, and scarlatina frequently, prevail in Dublin; and it may be occasionally expected that a woman who comes to the hospital to be confined is not only then in actual labour, but is also affected, though not perceptibly, with fever or scarlatina.

The published reports of the board of superintendence of Dublin hospitals throw much light on this subject. Previously there were no data to show what proportion of the mortality that took place in either of the Dublin lying-in hospitals was caused, year after year, by puerperal and other fevers, and the same was the case in respect to the extern attendance given by these institutions. Those reports show that in the seven years ended March, 1864, of 258 woman that died in the Rotundo, 131 died of puerperal fever, and of 45 that died in the Coombe, 15 died of it; and that this disease was a chief cause of the mortality in the Rotundo in each of the seven years.

As there is no doubt that the Rotundo authorities have considerably exerted themselves to improve the sanitary condition of that fine institution, and yet that a high mortality, chiefly from puerperal and other fevers, which are preventible diseases, takes place in it, it may not be amiss to observe that for several years the rate of that mortality has increased in it. Before 1854 the mortality ranged from one in 214, the lowest in any year, to one in $32\frac{1}{2}$, the highest—the average of the previous long period being one in 82; since 1854, included, the mortality has ranged from one in 64, the lowest in any year, to one in $13\frac{4}{5}$, the highest in any; the average of this twelve years being one in $37\frac{1}{3}$—facts, of which, possibly, the hospital authorities are not aware, and which can be only ascertained on a careful examination of the statistics of the institution.

We have also evidence in the returns of the board of superintendence that infectious fevers, as scarlatina, typhus, &c., are occasionally introduced into the Rotundo, and that even pyemia has prevailed there; and it is difficult, indeed, to conceive how, under the arrangement described by Dr. Shekleton, their occasional introduction can be prevented. As before observed, such women, on application, may be in the incubation stage of scarlatina, or of typhus; and even if her rejection were to depend on that circumstance being perceived by the master or assistant, he might not *then* be able to ascertain it. She is therefore admitted, and is placed in a ward along with other labour cases; it is only in a day or two that she is found to be ill of scarlatina or typhus, and then, whether delivered or not, she is in an unfit condition to be removed to a fever hospital. But even if so transferred, or if put into a separate ward intended for patients affected with contagious diseases, she has been long enough among the labour cases to introduce a poison which, in the existing condition of the labour patients, causes puerperal fever, a disease, of which Dr. Leon Le Fort, as well as Mr. Simon, observes that "*it is by contagion that this destructive scourge exerts its ravages.*"

Whether the puerperal fever that caused such mortality last April was preceded by the introduction of any contagious disease does not appear, but it is certain that a still greater mortality was connected with scarlatina in the year ended March, 1862, in which 2 labour cases died of typhus fever, 11 of scarlatina, 4 of pyemia, and 34 of puerperal fever. Referring to the mortality of that year, Dr. Bristow, who examined the hospital, observes:—"The outbreak furnishes an example of the well established fact that scarlet fever, typhus, and other exanthemata, are not only peculiarly apt to attack puerperal woman exposed to their contagious influence but are peculiarly fatal to them, and that these poisons prove a frightful source of contagious forms of the so-called puerperal fever."

It seems to follow from the foregoing data and observations that one mode of lessening the mortality of lying-in women in hospitals is, to limit the admissions to the classes that more particularly require hospital treatment, and to give extern attendance to those that do not. This opinion has been expressed in reference to the Rotundo by four different boards of commissioners, which have examined and reported on it, as is expressed by the commissioners appointed to report on the Dublin hospitals in 1855.

They observe—" We are of opinion that the practice of attend-
ing on patients beyond the walls of the hospital is not sufficiently
followed in this institution.   On this point we concur in the
opinion which was expressed by the Board of Health in 1820, and
which is referred to in the Reports of the Commissioners of 1830
and 1842.   We consider this subject to be worthy of more attention
than it has hitherto received, and that the principle of attending on
extern lying-in cases, *especially*, *during the prevalence of puerperal
fever*, should be acted on as extensively as possible."   The reports
of the Board of Superintendence of Dublin Hospitals show that
this recommendation has not been much acted on, as it appears by
them that, in the year ended March, 1862, of 978 labour cases that
were admitted, 80, or one in $12\frac{1}{2}$ died in the hospital—39 of puerperal
fever, and that only 144 had home attendance; and that in the
succeeding year 1,040 labour cases were admitted, and 41, or one
in $25\frac{1}{3}$, died, of whom 29 died of puerperal fever, and that only 2
had extern attendance in the year.

THE MORTALITY OF CHILDREN IN LYING-IN HOSPITALS.

We learn from Sir William Wilde's work, before quoted, that
out of 23,322 births which took place in the Vienna Lying-in
Hospital, 1,482 children, or one in $15\frac{2}{3}$, died before the ninth day,
and, that, of 4,453 births in that institution, in 1838, there died
200 children, which was one in 21 births.

The census report, of 1851, contains a table, which shows that of
35,131 births that had taken place, in ten lying-in hospitals, in
Ireland, 2,258 children died, which was an average of one in $15\frac{1}{2}$
births.

The census report, of 1861, shows that in the ten years then
ended, 25,249 children died in Ireland, under one month old, which
is a mortality of one in 55 births.   I am not aware of any return
that shows the mortality of infants under, about, ten days old, in
the whole population; but if it be one in 55 at a month, it must be
a lower mortality within ten days, as many die within the other
twenty days.

The printed statistical table, of the Rotundo Hospital, shows
that 177,708 children were born alive in that institution and in the
old hospital; and that 6,745 of them died in it, that is, in the few
days, generally 8 or 10, during which the mothers remain in
it.   This was a mortality of one in $26\frac{1}{3}$ children born alive.   The
proportions in which this mortality took place under the different

masters is very remarkable as will be perceived by the following table.

Table showing the Mortality of Children Born in the Rotundo Lying-in Hospital, under the Different Masters, and the Proportion of such Mortality to the Number of Children Born Alive.

Masters	No. of children born alive during the Mastership	No. of still-born children	No. of children died in hospital	Proportion of children died in hospital	Ranging from ( ) to ( )	Proportion of still-born children to all children born in hospital
1st	891	46	115	1 to 5⅔	1 in 8 to 1 in 5⅔	1 in 26⅛
2nd	3,657	197	708	1 to 5⅙	1 in 6½ to 1 in 5	1 in 19⅔
3rd	4,552	258	892	1 to 5 1/16	1 in 6½ to 1 in 4	1 in 18⅔
4th	5,735	410	921	1 to 6¼	1 in 8 to 1 in 5	1 in 22¼
5th	6,823	580	553	1 to 12⅓	1 in 25 to 1 in 7½	1 in 17½
6th	10,294	600	421	1 to 24 1/7	1 in 36 to 1 in 22	1 in 18 4/?
7th	10,993	974	401	1 to 23½	1 in 40 to 1 in 20⅓	1 in 23
8th	14,096	1,063	336	1 to 42	1 in 70 to 1 in 25	1 in 15⅓
9th	17,988	851	403	1 to 44½	1 in 62 to 1 in 28	1 in 18
10th	21,116	1,535	399	1 to 53	1 in 61 to 1 in 41	1 in 14⅔
11th	12,269	777	154	1 to 79	1 in 136 to 1 in 61½	1 in 17
12th	15,627	1,017	157	1 to 99	1 in 176 to 1 in 75	1 in 16⅓
13th	12,672	651	73	1 to 172	1 in 469 to 1 in 93	1 in 20⅓
14th	13,035	861	151	1 to 86	1 in 193 to 1 in 50⅔	1 in 16
15th	12,828	1,044	340	1 to 37⅔	1 in 66 to 1 in 32	1 in 13⅓
16th	8,707	711	312	1 to 28	1 in 44 to 1 in 20	1 in 13
17th	2,997	263	78	1 to 38	1 in 56 to 1 in 22¼	1 in 12⅓

Why that mortality should be from one in 4 to one in 7½, under the five first masters, and only one in 86, 99, and 172, under others, might suggest grave considerations. The subject appears to deserve more attention than, so far as I am aware, it has

yet received.   Dr. Clarke's improvement in the hospital ventilation would seem to have reduced the mortality from one in $12\frac{1}{2}$ to one in $24\frac{1}{2}$; but it appears remarkable that the mortality of women under him was one in 87, being in the time of his predecessors only one in 131, and in that of his successor one in $93\frac{2}{3}$.   It would be curious if an improvement that would be beneficial to infants should not also be useful to the mothers.

STILL-BORN CHILDREN.

We also learn from Sir William Wilde's work that 278,613 births that were registered in twelve cities in the Austrian dominions, and that 9,697 of the children were still-born, which was an average of one in $36\frac{2}{3}$ births.   The proportion ranged from one in $59\frac{3}{4}$ in one district to one in 21 in another.   But in Trieste it was so low as one in 155.   In the Vienna Lying-in Hospital 939 were still-born, in 23,413 births, which was one in $24\frac{9}{10}$.

The Rotundo statistical table shows that 186,209 births took place in the old hospital and in the Rotundo, up to the end of 1864, and that 11,289[a] were still-born, which was in the proportion of one to $16\frac{1}{2}$ births, ranging from one in $22\frac{1}{3}$, under one master, to one in $12\frac{1}{3}$ under another.

A question of considerable importance cannot be overlooked, namely, by which mode of attendance is medical and obstetric science best promoted.   Doubtless, were the advantages of both equal, or nearly so, the greater and the more exact experience obtained in hospitals would decide in their favour, but, if there be far greater loss of life attendant on that mode, the question cannot arise.   That there is far greater loss of mothers and of children in hospitals is now an admitted fact; but, though a much greater proportion may get home attendance, there will still be a sufficient number (of the exceptional cases that require hospital treatment) to afford ample materials for the instruction of pupils, and for affording information to the medical attendants.

P.S.—I beg to observe, that all the data and other sources of information referred to in this paper were obtained from published documents, which are as accessible to others as they are to me.—D. P.

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[a] The total is 10,447, but 11,289 is the number.

Statistical Table, referred to in page 86, 3rd paragragh :—

Year	No. of Births	No. of Women Died	Proportion of Deaths to Births	Year	No. of Births	No. of Women Died	Proportion of Deaths to Births
1760	556	4	1 to 139	1819	3,197	94	1 to 36
1761	521	9	1 to 58	1820	2,458	70	1 to 35
1763	488	9	1 to 54	1825	2,740	26	1 to 105
1764	588	12	1 to 49	1826	2,440	81	1 to 30
1766	581	3	1 to 193	1833	2,138	12	1 to 178
1767	664	11	1 to 60	1834	2,024	34	1 to 60
1768	655	9	1 to 41	1835	1,902	34	1 to 56
1772	704	4	1 to 176	1836	1,810	36	1 to 50
1773	694	13	1 to 54	1838	2,126	45	1 to 47
1774	681	21	1 to 32	1844	2,176	14	1 to 155
1782	990	6	1 to 165	1845	1,411	35	1 to 40
1783	1,167	15	1 to 78	1846	2,025	17	1 to 119
1787	1,374	10	1 to 134	1847	1,703	47	1 to 40
1788	1,469	23	1 to 64	1848	1,816	35	1 to 52
1789	1,435	25	1 to 57	1849	2,063	38	1 to 54
1790	1,546	12	1 to 129	1853	1,901	17	1 to 111
1791	1,602	25	1 to 64	1854	1,943	37	1 to 52
1792	1,683	10	1 to 163	1855	1,060	35	1 to 30
1793	1,757	19	1 to 81	1856	1,600	23	1 to 64
1800	1,837	18	1 to 102	1857	1,509	33	1 to 46
1801	1,725	30	1 to 57	1858	1,086	30	1 to 36
1803	2,028	44	1 to 46	1860	1,404	26	1 to 54
1811	2,561	24	1 to 107	1861	1,135	59	1 to 19
1812	2,766	43	1 to 64	1862	800	58	1 to 14
1813	2,484	62	1 to 40	1863	1,228	32	1 to 38
1817	3,473	32	1 to 108	1864	1,184	26	1 to 45½
1818	3,539	56	1 to 64				

Art. IX.—*Clinical Reports and Observations on Medical Cases.*
By J. T. Banks, M.D.; King's Professor of Physic; Physician
to Sir Patrick Dun's Hospital, &c., &c.

Some cases of surpassing interest have lately come under my
observation—cases unlike in many respects to any which have
hitherto been observed by me ; and, judging from my own ex-
perience that they must be of extreme rarity, I trust a brief
notice of them may be acceptable to the profession.

The first case I shall narrate is one of gangrene of the lungs,
an accurate history of which previous to the patient's admission
into Sir Patrick Dun's Hospital, I regret to say, I was unable to
obtain, for, owing to extreme debility and breathlessness, he could
scarcely speak, and little could be learned from his friends who
brought him to the hospital.   Mr. Collins, the resident medical
scholar, obtained all the information he could on receiving him
into the house on the 3rd of December last.   He learned that the
man was aged thirty-four, and had been from early youth a person
of extremely intemperate habits, and also that from the time he
had measles, when six years old, he had a " delicate chest."   Three
months before the date of his admission into hospital he had some
pulmonary affection which, from the account given of it, was
probably of an acute character.   During this illness the ex-
pectoration was said to have been very abundant, and to have
contained some blood, but not in any considerable quantity.   At
no period of his life had he hemorrhage from the lungs.

About two months before he sought medical assistance he is said
to have spat up a very large quantity of purulent matter, of so
offensive and overpowering a nature that the smell had such an
effect on himself as to produce nausea and vomiting.

A sudden aggravation of the symptoms under which he had for
some time laboured induced him to seek aid, but he was, from
the report of Mr. Collins, in a state which indicated speedy
dissolution when he was admitted.   The prostration was extreme,
the expression of his countenance was indicative of terror and
anxiety.   His respiration was 72 in a minute; his pulse feeble,
flickering, and intermitting—on first examination only 82, but soon
rising to 130 in a minute.   His lips were livid, and the face of
death-like paleness; the eyes sunken, and the features pinched.
He was harassed by a paroxysmal cough, and by the expectoration

of such an enormous quantity of fluid that it appeared as if he must be speedily suffocated. When I saw him for the first time, a few hours after he came into hospital, I learned these particulars, and on investigation of the case, fully concurred in the opinion formed by Mr. Collins, that the case was one of gangrene of the lung.

Obscure as the disease so often is, there was in this case a combination of symptoms which enabled us unhesitatingly to arrive at the diagnosis. On entering the spacious ward in which the patient lay, the windows of which were open, I was assailed by an odour so insufferably offensive that I fancy my nose would well nigh suffice to enable me to tell what the disease was, being, unfortunately, endowed with a more than ordinarily acute sense of smell. A near approach to the bed was particularly unpleasant, as the atmosphere about him was loaded with the effluvia from the breath, and from the expectoration, which was being brought up in such quantity that an ordinary spitting cup did not answer for its reception—a large vessel being necessary. The expectoration was of a greenish hue, purulent, and of a peculiarly disgusting odour. The patient was intolerant of the slighest movement, believing that any change of position would cause an increase of the expectoration, and thus inevitably deprive him of the power of breathing. An examination of the chest with any degree of accuracy appeared to us, under the circumstances, to be unwarrantable, and in truth, a close and protracted physical examination would be to most people a most painful proceeding. From the moment that the patient was first seen the lethal nature of the disease was manifest, and with that prescience which we so often observe among the dying, he was himself fully persuaded that his end was rapidly approaching.

Stimulants were unsparingly administered; large doses of quinine with nitro-muriatic acid were given, and turpentine inhalations were employed. The stimulants had no influence in checking the downward course of the disease, and after a distressing struggle he died in about forty-eight hours after his admission, having been unconscious for a few hours before his death.

The autopsy revealed the following appearances:—Both lungs were found adherent to the costal pleura, and were of a greenish-black colour; patches of a deeper hue were observed on the surface, which, on being cut into, gave exit to a purilaginous ichor of a most offensive odour. On cutting into the lungs they were found

to be soft and friable, chiefly a dark-green shreddy pulp, from which fluid and air could be pressed.   In many parts small yellowish cheesy masses existed.   A large anfractuous cavity occupied part of the middle and upper lobes of the right lung. There was no part of the pulmonary tissue which retained a trace of its original texture—part was of a green colour, of some consistence, and part was in a state of liquefaction.

The bronchial membrane was of a deep purple hue, almost black. The trachea, at its bifurcation, was surrounded by a large number of glands of unusual size, as were also the primary bronchi.   The pulmonary artery and its branches, as well as the other vessels of the lungs, were traced with much care into the gangrenous mass without the existence of embolism being discovered.   Not only was there no healthy lung remaining, but there was no portion solid which could indicate a pre-existing stage of inflammation. In point of fact, the whole extent of both lungs was in a state of sphacelus.

Before the time of Laennec gangrene of the lung was believed to be a not uncommon disease; but he showed how fallacious was this belief.   The infreqnency of the disease is proved by the fact that many physicians have never met with it in the course of extensive practice.   Sir John Forbes says:—" Gangrene of the lungs is an extremely rare disease.   I do not think that I ever met with a case in practice, and certainly never witnessed the lesion in the dead body."

Of late years, if we accept the numerous cases of so-called gangrene of the lung which have been published as veritable and unequivocal examples of the disease, we must admit that the opinion of Laennec cannot be received without qualification.   I confess to being sceptical as to many of the cases, which terminated in recovery, being gangrene, and I think a consideration of the lesions of the lung, which sometimes closely simulate the disease in question, will fairly lead to this conclusion.

There is no pulmonic disease so likely to be mistaken for gangrene of the lung as *fetid abscess;* and to this point Sir Henry Marsh has called attention in his highly practical and interesting lectures on the subject.   He observes:—" When the fetor is intense, cases of true fetid abscess are described and named as gangrene, or sloughing abscess of the lung, and one cannot be surprised at the mistake, so offensive in some cases is the odour.   True gangrene of the lung I believe to be a comparatively rare affection."   It

strikes me that much of the error which prevails may be ascribed to the belief that gangrene is one of the terminations of ordinary inflammation of the lung, and when pneumonia terminates in abscess, and that fetid matter is discharged, the conclusion is hastily arrived at that a disease of a much more formidable nature had existed, and the recovery is looked upon as a most unusual event. It must, I think, be admitted that gangrene only occurs as a termination of pneumonia under peculiar conditions of the system, as in malignant forms of the eruptive fevers, dysentery, yellow fever, plague, glanders, &c., &c. In some reported cases of gangrene of the lungs, said to be a sequel of pneumonia, it is highly probable that the gangrene was the original disease, and the inflammation of the neighbouring parts a secondary lesion. Laennec's view of the nature of gangrene of the lung appears to me to be the most reasonable. He says:—" La gangrène du poumon semble même, le plus souvent, se rapprocher de la nature des affections essentielle-ment gangreneuses, telles que l'anthrax, la pustule maligne, le charbon pestilentiel, &c., &c. ; et comme dans ces affections, l'inflammation developpée autour de la partie gangranée paraît être l'effet, plulôt que la cause de la mortification."

Much interest attaches to the etiology of gangrene of the lung, and much obscurity prevails. There is one class in which gangrene of the lung is said to be very frequent, namely, the insane. This statement is repeated and perpetuated in every book in which the subject of gangrene of the lung is mentioned. Fischel, of Prague, gives the relative frequency of the disease in the insane and the sane. In 1,000 autopsies of sane persons gangrene of the lung was found in 16 bodies, whilst in the insane in 74.

In the hospital for the insane at Ghent, Guislain observed fifteen cases, and he attributes the disease in many instances to obstinate refusal to take food, and the consequent alteration of the blood. In connexion with this observation, I may refer to the case reported by Ribbentrop of a sane person who, after having for some time laboured under cancer of the œsophagus, was attacked with gangrene of the lung; and here the disease was supposed to be the consequence of inanition; but the ingesta may have passed into the bronchi, and thus given rise to the disease. With respect to the great comparative frequency of gangrene of the lung amongst the insane, my experience does not support the statements made by foreign physicians.

I have seen cases of fetid abscess of the lung in the insane, but

I have never seen a case of true gangrene. My friend Dr. Lalor, the Medical Superintendent of the Richmond Asylum, who has been engaged for twenty years in the treatment of the insane, informs me that he has never seen a case, in nearly 3,000, which have passed under his observation.

Of the specimens of gangrene of the lung brought before the Pathological Society (about twelve in thirty years) only one was taken from the body of a lunatic, who had been under the care of Professor Law in the Dundrum Asylum. It seems, at first sight, difficult to reconcile these conflicting statements, but it is after all an easy matter.

The truthfulness of the reports of the Continental physicians I have referred to is beyond all question; we must therefore admit the fact, and seek for an explanation, and I have no doubt that the absence of gangrene in our asylums depends on the inproved mode of managing the insane of late years. Formerly all the conditions most likely to favour the development of gangrene and other cognate diseases were in full operation in hospitals for the insane. The improvement is not confined to English hospitals, but has also taken place in Continental hospitals; and doubtless the great relative number of cases of gangrene of the lungs no longer exists. Wunderlich tells us that he learned from an eminent alienist physician that in his establishment, in which the practice prevailed of keeping the patients the whole day in the open air, gangrene of the lung was unknown. Cruveilhier has particularly noticed that gangrene of the lung is frequent among epileptics; and again I must observe that this is not in accordance with my own experience.

The prolonged and excessive use of spirituous liquors, combined with the usual consequences, misery and want, have been supposed to play an important part in the etiology of gangrene of the lung.

In this case lately under my observation, as well as in those reported by Drs. Stokes and Gerhard, the subjects of the disease were confirmed drunkards, but how little does the frequency of gangrene of the lung accord with the presumed causes.

So far from some of the persons who have laboured under the disease being broken down in constitution by intemperance and want, it is stated, particularly by Mosing, that in the epidemic which occurred in the house of correction at Lemberg, those who were attacked were chiefly young and robust individuals.

It is probable that the man whose case has suggested these

observations was long the subject of tuberculosis of the lung; that the lining membrane of the tubercular cavities became the seat of sphacelus, which subsequently extended to the tissue of the lung, and finally, in the last few weeks of his existence, involved both lungs.

The case is in one respect noteworthy, inasmuch as I know of no recorded example of the disease in which the lungs throughout their whole extent were found in a state of putrefaction.

Cerebro-spinal Arachnitis.—Some remarkable and unusual forms of disease have been observed within the last twelve months in this city. Cases of cerebro-spinal disease, or at least presenting phenomena closely resembling the disease with which we were at one time familiar in an epidemic form, have occurred. In the greater number there has been no examination of the body after death; but, however, from a careful consideration of the phenomena observed in them, and a comparison with those cases in which an autopsy has verified the diagnosis, I believe we may assume that the disease, although as regards the discolouration of the skin, so to speak, a new disease, was nevertheless cerebro-spinal arachnitis.

In *The Dublin Medical Press*, May 30, 1866, I published a case of this terrible disease, and I then called attention to the state of the skin, which was of a deep cyanotic hue, and which to the same extent I had never before seen in cerebro-spinal arachnitis.

The subject of the disease was a boy aged fourteen; the duration of his illness was three days. The *post mortem* examination exhibited the ordinary appearances of cerebro-spinal arachnitis. On the 30th of December last I was requested by my friend Dr. Newland to see a patient with him, who had been suddenly taken ill the night before. The history of the case is shortly as follows:— A boy, aged fifteen, a grocer's apprentice, had been, up to the night of the 29th December, apparently in perfect health. He had been hree months residing in Dublin, having previously lived in the country. He had exhibited no sign of delicacy—he was extremely well fed and cared for in every respect, and there was nothing in his manner of life, so far as could be ascertained, calculated to act injuriously on his constitution. Late in the hevening e was observed to look ill, and he was recommended to go to bed.

On being visited soon after he retired, he complained much of his head and of sickness of his stomach; he had got out of bed, and was so faint as to be unable to get back. At midnight he was

visited by Dr. Newland, who found him complaining of headache, intense thirst, general uneasiness, and sickness of stomach. The next morning a remarkable change in the symptoms had taken place. The legs and arms were thickly covered with spots. The pulse, which the night before was very rapid, was now almost imperceptible; the expression of the face was much altered, he had incessant vomiting, and the restlessness was extreme. About noon I saw him, in consultation with Dr. Newland, who detailed to me the history of the case as I have given it. We found him in a state of great depression. Frequent vomiting, particularly on taking any fluid. The pupils neither dilated nor contracted, but little influenced by light, and there was strabismus of one eye. The legs and arms presented an extraordinary appearance, being covered with spots of a purple colour, of different sizes, some regular and round, and about the size of a florin, others irregular in shape. On passing the finger over the surface, the spots were found to be slightly elevated. The body had some spots, but not many. There was no retraction of the neck, but the boy had complained of pain along the spine, and in the legs, and the sensibility of the surface was exalted. He was pulseless, and the temperature of the extremities was very low.

Again I saw the boy at ten o'clock at night, with Dr. Newland, who kindly permitted my colleague, Dr. Bennett, to see the patient, as he had observed the case in Sir P. Dun's, which had manifested symptoms so closely resembling those in this case. There had been from the first no effort at rally. Stimulants had no effect, even when retained, but generally the brandy was rejected. The first sound of the heart was inaudible, and no pulsation existed in the carotid or femoral arteries. He seemed utterly unconscious of everything. From four o'clock in the afternoon until his death, which occurred in about thirty hours from the onset of the disease, the boy had three attacks of convulsions. The rapidity of this case was greater than that of the case recorded by me in *The Dublin Medical Press*, but the resemblance to it was very striking, and was immediately recognized by Dr. Bennett; and we agreed as to the extreme probability of finding, in the event of our obtaining permission to examine the body, similar appearances in the brain and spinal marrow. It was impossible to obtain a *post mortem* examination.

The case was a fearfully appalling one in the suddenness of the seizure and rapidity with which collapse set in, a few hours only

intervening between the period when he seemed in perfect health and when death was inevitable.

All remedial agents in such a case are alike powerless, nothing seems to have the slightest influence in staying the fatal progress of the disease. This case and the one referred to which, resembled it, were unlike the sporadic cases of cerebro-spinal arachnitis, but forcibly reminded me of the epidemic form with the epiphenomenon of discolouration of the skin and spots. A remarkable and striking feature which had never, I believe, been seen in the cases in France or in this country when the disease was present in an epidemic form, nor until lately in any of the sporadic cases which have come under my own observation since the year 1846.

Art. X.—*Reports in Colonial Practice.* By Hugh Croskery, L.R.C.S.I.; Member of the Surgical and of the Obstetrical Societies of Ireland; Fellow of the Obstetrical Society of London; Corresponding Member of the Scientific Association of Trinidad; and late Editor of *The West India Quarterly Magazine*, Chapelton, Jamaica.

1. ON THE VALUE OF TARTAR EMETIC IN COMPRESSION OF THE BRAIN, AND IN CONTROLLING CONVULSIONS AND MANIACAL EXCITEMENTS DEPENDENT THEREON.

2. ON A CASE OF LEUCOCYTHEMIA, COMPLICATED WITH RECURRENT ATTACKS OF HEMATEMESIS AND ASCITES; ALL DEPENDENT ON AN ENORMOUSLY ENLARGED AND INDURATED CONDITION OF THE SPLEEN; WITH REMARKS ON THE SPLEEN AND ITS FUNCTIONS, FOUNDED ON OBSERVATIONS MADE DURING A CLOSE ATTENDANCE ON THIS CASE FOR A PERIOD OF NINE YEARS.

3. CASE OF SPINAL MENINGITIS, TREATED BY OFTEN-REPEATED DOSES OF OPIUM AND QUININE, AIDED BY THE CONTINUOUS APPLICATION OF POWDERED OPIUM, COMBINED WITH MERCURIAL OINTMENT TO A RAW, BLISTERED, SURFACE ALONG THE SPINE; RECOVERY.

4. CASE OF DOUBLE HEPATIC ABSCESS, OCCURRING AS THE RESULT OF A PROLONGED ATTACK OF DYSENTERY; THE FLUID EVACUATED THROUGH PUNCTURES MADE IN THE ABDOMINAL WALL AFTER UNION HAD BEEN ARTIFICIALLY ESTABLISHED BETWEEN THE LATTER AND THE LIVER; RECOVERY.

5. CASE OF EMPYEMA, THE RESULT OF A SUBSCAPULAR ABSCESS
   HAVING BURST INTO THE CAVITY OF THE CHEST; PUNCTURE
   THROUGH THE WALLS OF THE ABSCESS; RECOVERY.
6. AN ACCOUNT OF FOUR CASES OF STRANGULATED HERNIA,
   EACH OF WHICH PRESENTED SOME POINT OF INTEREST.

1.—*On the Value of Tartar Emetic in Compression of the Brain,
and in Controlling Convulsions and Maniacal Excitement Dependent
Thereon.*

G. H., a young white Creole [a] gentleman, had been suffering for
some days from languor and pain in the right hypochondrium.
On Thursday morning, the 31st of October, 1861, he left his
bedroom, about six o'clock, in his usual good health and spirits, and
partook of the accustomed Jamaica dish—a cup of good coffee—
usually served at that hour of the morning. He went out for a
stroll, and was seen to walk with a steady and buoyant gait. An
hour afterwards he was found, about five hundred yards from the
house, in a fainting state, and with his body lying on the pathway
leading through a pasture on the hill-side. Being in the house at
the time, I was called to him at once, and found him with contracted
pupils, a feeble pulse, a cold, pale, skin, and completely unconscious.
He was lying where, a short time before, he had been discovered,
with his body up and down the hill, and in such a position as—if
coincident circumstances did not point to a different conclusion—
to lead to the belief that he had either laid himself down to rest
there, or that he had felt faint, and had fallen down at the spot
where he had been found: his head rested on a place by no means
hard, and his hat was found not far from his person.

When I first saw him, he was in a state of syncope, which might
have been the result of a heavy fall, and consequent concussion of
the brain, or of sudden faintness from the exertion made use of in
ascending or descending the hill. His state of health for some days
previous—and the fact that no cuts or bruises about the head, or
stones about the spot, could be discovered—tended to convince me
of the probability of the latter being the cause of the mishap.
With this belief he was kept a short time where he was, in the
horizontal posture, and a stimulating salt was applied to the nostrils.
In a very short time, however, it became quite evident that he had

[a] "Creole" means, simply, born in the West Indies.

suffered, in the first instance, a severe concussion of the brain, and that some rapid effusion was taking place as a consequence; the symptoms of concussion being rapidly succeeded by those of compression. (It was discovered afterwards that, in running down the steep descent, the heel of his boot had slipped on the root of an orange tree which projected out of, and ran for some distance along, the ground, and that he had been, in consequence, precipitated down the hill—his head falling backwards, heavily, on the ground). Unconsciousness soon merged into complete insensibility; the pupils became widely dilated; the face and neck suffused and red; and the body violently convulsed. I had him removed into the house at once, and, before many minutes had elapsed, twenty ounces of dark blood had been taken rapidly, *cum pleno rivo*, from the arm, and a bolus, of fifteen grains of calomel, had been washed down his throat. The convulsions, however, continued to be frequent and violent; and, before another hour had passed, twenty ounces of blood, as dark as before, had, for for the second time, been abstracted from the arm.

About nine o'clock, a.m., the convulsions had ceased, but a deep coma remained; the breathing continued to be stertorous; the pupils dilated; and the muscles, principally of flexion, rigid and contracted. A cold evaporating lotion had, from the first, been applied to the head; and evaporation was still encouraged and aided by the steady action of a palmetto fan.

An enema, containing olive oil, turpentine, and a few drops of croton oil suspended in thin mucilage, was given about ten o'clock, and this had the effect of removing, about two hours afterwards, a large quantity of very offensive matter. The pupils continued to be widely dilated; at times the heart would beat violently, and the eyes became suffused; but these bad symptoms were always kept in check by the timely and judicious exhibition of small doses of tartar emetic, repeated as often as the pulse indicated an increased circulation; the hair had, of course, been removed.

This young man remained completely insensible for four days; and it was not until the evening of the fourth that he became at all conscious.

I cannot speak too highly of the value of tartar emetic, and of its powers in such cases as an antiphlogistic and sedative. I desire that this case should be placed on record to prove this; and also because it exhibited many points of interest, which, although they can now be only cursorily referred to, might have been dwelt on at

the time, when all was fresh in the memory, with profit.   In Jamaica—and more especially in the country parts, where one has so much saddle-work, and so many wearisome rides through mountain passes, and under such a burning sun—it is impossible to sit down and write after the fatigue of the day is over; much of great interest to the profession might be recorded otherwise; and one sometimes regrets that he has neither the time nor the inclination to place on record what he sees and observes.

I have thus diverged a little from the subject, in order to explain why I am compelled to trust, principally, to memory for the details in this case.   But to return to the facts:—I found that small doses of tartar emetic, combined with henbane and digitalis, given frequently, calmed the pulse and warded off many paroxysms of convulsive excitement—so to speak.   Of course other items of treatment, viz.: a blister early applied to the back of the neck and head; mercurial dressings to the blistered surface, and mercury and opium given so as to touch the gums; all combined to check and ward off inflammation, and to effect a permanent cure.   I wish, however, to speak particularly of the value of tartar emetic in this case, as I found it, and as it impressed itself on my memory at the time. Each apparently appproaching fit, as indicated by redness of the face and conjunctiva, fulness of pulse, and jumping carotids, with muscular twitchings, &c., was immediately subdued by the tartar emetic, combined, as it was, with henbane and digitalis.

Strange to say, in this case, when consciousness returned, after a lapse of four days, this young man was a maniac; he had all sorts of fancies, and was at times very much excited; when paper was given to him for cleansing purposes (I will be understood when I so express myself), he would fancy, and insist, that it was all stuck over with pins, and he would pull out the imaginary pins and count them into a hand, or on the table, up to any number; he had lost the memory of names, but not of numbers; and he would wander about the house, and climb up and examine the top of the wardrobe, which his excited imagination would picture as something else. This maniacal excitement, too, was kept in check—and completely so—by tartar emetic, frequently administered; and, from the good effects thus, at all times, made apparent, I was able to assure the boy's sorrowing friends that this excitement would pass over, and that reason would be left intact, after the lapse of a few days; and so it was.

Five years have since elapsed, and my patient of that time is now a thriving planter, and a clever young man.

2.—*On a Case of Leucocythemia, Complicated with Recurrent Attacks of Hematemesis and Ascites ; all Dependent on an Enormously Enlarged and Indurated Condition of the Spleen ; with Remarks on the Spleen and its Functions, Founded on Observations made during a close attendance on this Case for a period of Nine Years.*

I published a report of this case in *The Dublin Hospital Gazette* of the 1st of February, 1858; and, again, a further report in the same Journal of the 1st of August, in the same year.

It becomes my duty again, for the third time, to bring this case under the notice of the profession; and I make no apology for so doing, because I have had further opportunities of observation, and because, since the publication of my former reports, much has occurred, during the progress of the case, greatly to interest the medical observer.

I regret, however, that the demands of an extensive and wearisome practice has not permitted me to take notes of interesting details, from time to time, and that I shall only be able to give, from memory, a synopsis of symptoms, and of the mode of treatment employed. I quote, however, from notes of that date:—" In September, 1857, Master Edward Ewbank had an enlarged spleen, from repeated attacks of intermittent fever, and residence in a malarious district. I was suddenly sent for; and, on my arrival, I found that the child, who was only three years of age, had vomited about twelve ounces of blood. There was a good deal of excitement of the system, as indicated by carotid pulsation, and a small and rapid pulse at the wrist. Small doses of turpentine, beaten up with yolk of egg, were given, at intervals of ten minutes, with success.

"On the following day the hemorrhage again returned; the same treatment being adopted. He was kept quiet, and aloof from all excitement, for several days after this attack; and a mixture of sulphuric acid and digitalis, with infusion of rose leaves, was administered, at intervals of three or four hours, throughout the day.

"Hematemesis, however, returned ten days after the last attack, and was, on this occasion, accompanied by melena. For the turpentine small doses of sugar of lead were now substituted, but with little better effect than that of arresting the hemorrhage for the time. When the stomach became irritable, the lead was given by enema.

"On Saturday night, the 12th of September, he not only had a return of the hematemesis, blood being lost in large quantities, but he coughed up blood also from the lungs. I should mention that, from the first, the spleen was of an enormous size, and that it occupied, in the first instance, nearly one half of the child's abdominal cavity. From repeated blistering, and the application of iodine paint, it had now become considerably reduced in size.

"I was summoned, early on the morning of the 13th; and, on my arrival at the house, I found the child cold, convulsed, almost pulseless, and with pupils dilated almost to their entire extent.

"The first strong stimulant that came to hand, viz., camphorated rum—which is always to be found in Jamaica homes—was at once thrown up, in considerable quantity, by enema, for the child could not swallow, and was apparently dead; and the body was wrapped up in warm flannels, sinapisms being at the same time applied. The enema was repeated, and with the most happy results. Within an hour and a-half after I had entered the house the pulse had got up, its natural heat had returned to the body, and the child, which had been in a state of syncope for four hours, became conscious."

It was quite evident to me that the spleen was the primary cause of all this mischief, and that, if this boy's life was to be saved, I must adopt some course by which an immediate reduction of the size of this organ should be effected; while, at the same time, the stomach should be kept in a perfectly quiescent state.

I shall not, at this stage of the paper, enter further into the subject of the functions of the spleen, than to state my reasons for adopting the course to be presently described, and which I found to be so effectual.

The spleen is so intimately connected with the stomach by vessels, and otherwise, that it is easily understood how congestion of the one is associated with congestion of the other, and *vice versa.* Here I had to deal with a case of enormously enlarged and indurated spleen, with recurrent hemorrhage as the immediate consequence of any sudden increase of its volume. It was, then, not difficult to come to the conclusion that each time at which blood was shed was merely an over-effort of nature to rid the vessels of the great end of the stomach—where so intimate an anastomotic circulation is kept up between them and the sinistra branch of the splenic—of the unusual quantity of blood circulating through them.

I resolved, then, in order to give the stomach perfect rest, to

sustain life by enemata alone, and not to give a single morsel of anything by the mouth for some time. Accordingly, the child was kept alive for the next ten days entirely by food injected into the rectum. Enemata of rich chicken broth or beef-tea, when beef could be obtained, were administered every second hour, night and day, and were almost all retained and absorbed.

At the same time, in order to improve the quality of the blood, and to effect a reduction of the size of the splenic tumour, two grains of sulphate of quinine, and two of sulphate of iron, with sufficient sulphuric acid to dissolve them, were added to, and given with, each second enema, or even more frequently at first.

Besides this combination of quinine and iron by enema, a dose of ten drops of the syrup of the iodide of iron, in a small quantity of water, was given three times a day—this being the only fluid thus taken—by the mouth; while iodine paint, or ointment, was duly applied over the region of the spleen.

Under this treatment the hemorrhage from the stomach was completely arrested, and did not recur again for some years, and the child gradually gained strength. After ten days the enemata were entirely given up, and nourishment and his quinine and iron were given by the mouth.

At this time, however, the spleen, although much smaller, was still bulky enough to cause irritation and mischief. My notes of that time somewhat thus describe it:—

" The spleen is still enlarged, and can be felt in its entire outline. It occupies the left hypochondriac and lumbar regions, and projects into the umbilical, where a deep notch can be felt at the hylus, which projects forwards, instead of looking backwards and inwards, as in the natural state. The tumour can be moved backwards and forwards with the hand."

No sooner had the hemorrhage been conquered, than one of the other sequælæ of enlarged spleen appeared. Ascites suddenly set in. As soon as I found this to be the case, I resolved to have the child moved, at all hazards, from the bed of malaria, where his father's house was situate, to a more healthy and elevated spot. This was at once done; and although vapour baths, diuretics, and diaphoretics, &c., were given, with the view to bring into increased action the kidneys and skin—and, at the same time, with the aid of the purgative action of compound powdered jalap, to remove the fluid that had become so rapidly secreted—the abdominal cavity was so much distended on the fourth day as to interfere materially with

respiration. In addition, the poor little fellow, who, as I said before, was only three years of age, had incessant thirst, and a dry harassing cough.

Still the urine continued scanty, high coloured, and of high specific gravity; and the skin remained rough and dry.

I had been giving him, up to this period, the 30th of September (symptoms of ascites having been observed, for the first time, on the 26th), a mixture of the solution of acetate of ammonia, with acetate of potass, a small proportion of tartar emetic, and sweet spirits of nitre, in camphor julep; but, as the disease had progressed so rapidly, and the above combination appeared to do no good, I omitted it, and substituted for it a simple mixture of cream of tartar, sugar and water, with a proportion of spirits of nitric ether in it—the child to drink about an ounce of this every hour. The result was surprising. In about six hours a decided change took place, and the kidneys began to act powerfully. The next morning the circumference of the belly was one inch and a half less than it had been the day previous, and he had copious alvine evacuations during the night. The mixture was, of course, continued, and the child allowed to drink it *ad libitum.* I should mention that I had never omitted to look after the condition of the spleen, and that the child continued to take his iron as before.

On the fourth day after the cream of tartar had been commenced the girth of the abdomen had been reduced by four inches; and its walls, which had heretofore been stretched even to bursting, were now loose and flaccid. His vapour baths at night were continued, and a few drops of paregoric and of compound spirit of ether added to his mixture, completely relieved his cough. His skin also was soft and moist, and the kidneys were acting profusely.

But all the good that had been done was neutralized by carelessness on the part of his nurse, who allowed him to lie naked in his bed after he had a vapour bath—the weather at the time being moist and unfavourable. The result of this carelessness was a rapid re-accumulation of fluid, notwithstanding all the means taken to prevent it.

The child was tapped, and ninety-two ounces of a clear, straw-coloured fluid, highly albuminoid, and of a specific gravity of 1010, removed. He was tightly swathed in flannel; and a mixture given, containing bitartrate of potash, nitric ether, acetate of ammonia, tincture of digitalis, and tartar emetic. Besides this mixture, a dose of ten grains of saccharated carbonate of iron was given, three

times a day, and the bowels were kept freely open by occasional doses of compound powder of jalap.

Notwithstanding all this, the abdominal cavity filled up rapidly for the second time; and the feet, legs, and scrotum became œdematous. His breathing having become much oppressed, he had to be tapped again on the twenty-fifth of October, the first tapping having taken place thirteen days previously. On this occasion a large wash-hand basin of fluid was drawn off.

Again was the prescription altered; and a combination of nitrate and bitartrate of potash and sweet spirits of nitre, made up into a mixture with syrup and water, was given instead, in tablespoonful doses, every third hour.

He was also ordered to take citrate of iron and quinine, with syrup of iodide of iron.

To further stimulate the absorbents an even and regulated pressure was kept up over the abdomen.

Six days after the second tapping the abdomen had again become full of fluid, notwithstanding all efforts made, in the meantime, to restore the balance between secretion and absorption; and, besides the swellings in the dependent parts of his body, his face began to be œdematous.

As a last resource, I determined to give mercury; and gave three grains of hydrargyrum cum cretâ, and two of antimonial powder, every third hour. I discontinued all else except a diuretic mixture.

The mercury was commenced on the morning of the 1st of November; and on the evening of the 2nd its good effects had become plainly evident. His appetite, heretofore inordinate and depraved, now became regular; the swellings in the legs, face, and scrotum had already disappeared; the circumference of the abdomen was, by measurement, ascertained to be less; the kidneys were acting freely, and a sensible perspiration pervaded the entire surface of the body.

Ten days after the mercurial treatment had been commenced every symptom of the disease had disappeared; and the child had gained strength to such a degree as to be able to run about the house.

Under the influence of iron and quinine, administered for some time after, and at such periods as the spleen showed an increase in size, from malarious influences, or occasional attacks of intermittent fever, this boy became, comparatively speaking, well; and he had,

for some years, an exemption from any attacks of hemorrhage, or from any return of secretion of fluid in the cavity of the belly.

When he became a lad of eleven, and while at a boarding school, in a rather humid locality, in Jamaica, he got fever, with of course, an increase in size of the splenic tumour. A severe attack of hematemesis again occurred, and recurred as before; but, under treatment he again became comparatively well.

He never, however, lost the waxy, chlorotic, leucocythemic appearance which I have always observed to be peculiar to people who suffer from splenetic affections. Up to this period, and ever since he had been three years old, he always carried in his countenance the marks of his hidden affection; and, although he became a smart, lively lad, and could gallop his pony about the country like other boys of his age, his waxy look, which never left him, indicated, to the medical observer, a bad prognosis in regard to the future.

I have always made the remark, that this lad would, again and again, be subject to attacks of vomiting of blood; and I have, over and over again, tried to impress on his parents the absolute necessity of their entering into some arrangement by which he could be sent to a colder climate. I am strongly of opinion that, had my advice been taken, the lad's spleen would have, by the natural effects of climate alone, become so much reduced in size as to be enabled again to perform its proper functions in the animal economy; and I should not now have the painful duty imposed upon me of relating how accurately the unfavourable opinion which I formed of this case in the past has been verified.

On two occasions, within a few months of each other, and after the boy had attained the age of twelve years, he had attacks of hematemesis. On the first occasion, bright red blood came up; on the second, he vomited blood of a darker hue, and passed melanotic stools afterwards.

In both attacks I was quickly with him. Full doses of sulphuric acid was the treatment generally employed, in the first instance, with a blister or strong tincture of iodine applied to the spleen. After twelve hours, or so, according to circumstances, I poured in, frequently, small doses of sulphate of iron and sulphate of quinine, with an excess of acid (sulphuric) in each draught. This mode of treatment always checked the hemorrhage, in the first instance; while, at the same time, it tended to improve the quality of the blood, thus telling on the functions of the spleen for the time. Last—not least—it always had the effect of reducing somewhat in

size the enlarged and indurated tumour, which was the cause of all this mischief.

Not long after the last attack of throwing up blood, and notwithstanding the administration, constantly, of iron and quinine tonics—or rather the ordering of them, for I believe they were omitted oftener than they were taken—notwithstanding my often repeated assurances as to the necessity of their never being omitted—the boy got ascites.

On the 2nd of September, 1866, it became very evident that the spleen, which was always movable and in direct apposition with the abdominal wall, was now more easily moved than ever; and that, on being pushed gently away, it displaced fluid on its return to its old position. The usual mode of ascertaining the presence of fluid in the cavity of the abdomen showed also, but too plainly, that the boy was in for ascites for the second time, and after the lapse of upwards of nine years, since the first prolonged attack.

His measurement round the body was, on the second of September, 29 inches over the navel, and $32\frac{1}{2}$ inches higher up, over the greatest convexity of the splenic tumour. I examined him, by measurement, at intervals, in the latter region, in order to be able to ascertain the effect of treatment on the spleen.

Quinine and iron were poured in now, more than ever, as much as the stomach, which was frequently irritable, would admit; the spleen was constantly painted with iodine—or rather the abdominal wall over and around it—diuretics and diaphoretics were given, and vapour baths at night, closed the remedial treatment of the day.

I should mention that, immediately before this last attack of dropsy, his mother had, very unfortunately, given him a dose of salts without my sanction or knowledge; and while I was trying hard to improve the quality of his blood, this draught ended all the good that had previously been effected. I should also mention that, at this particular time, an ulcer on his leg, which had previously been of an indolent character, now assumed a sloughy black appearance, and the odour from it was intolerable; a few poultices, however, made with bread and a weak solution of chloride of lime, or soda, soon put this to rights, and the sloughs were cast off, leaving the sore clean, but open as before.

Between the dates of the 2nd and the 9th of September the measurement of the girth round the body varied, one day being less, and again becoming increased. On the 13th, he had become

considerably enlarged, the girth measuring, as before, now being
$32\frac{1}{2}$, $33\frac{1}{2}$.

In addition to the other items of treatment, I now resolved to
try, with caution, a few alterative doses of mercury, and he was,
accordingly, given one grain of grey powder combined with two
grains of Dover's, every third hour. On the 15th instant he was
very much reduced in size, and the mercury and Dover's powder
were continued. On the 17th I omitted the grey powder, as the
size of the abdomen remained stationary, and gave him four grains
of Dover's powder, three times a day instead. Instructions were
given, at the same time, to keep the bowels open, by giving an
occasional dose of compound powder of jalap.

On the 20th, I made the following note:—" I wish him to take
more iron in the day, and to begin to take it sooner, so that he
may be able to take it, at least, four times in the twenty-four hours.
In order to be able to do so, he may take less of the diu-diaphoretic
mixture. Continue the Dover's powders as before."

On the 24th, finding the spleen larger, I directed that he should
take 30 drops of the syrup of iodide of iron, three times a day,
instead of the former preparation of quinine and iron, which, how-
ever, I directed to be taken every alternate day, with the syrup.

On the evening of the 24th, I was summoned to him, and found
that the sudden enlargement of the spleen, observed in the
morning, had, true to former instinct, terminated in another attack
of hematemesis. I stopped all other items of treatment, placed a
blister over the spleen, and ordered ten drops of elixir of vitriol,
to be taken through a tube, every third hour, in two-thirds of a
wineglass of water. The girth, over the spleen, was now $35\frac{1}{2}$,
while that over the umbilicus was 33 inches.

On the 26th, I ordered that two grains of quinine should be
added to each acid draught; and on the 27th, in addition to this,
he resumed his iodide of iron.

After this date, the abdominal fluid became secreted with great
rapidity; and as I clearly saw that I should have to tap him at no
distant date, I continued to pour in as much iron and quinine as
could be taken, in order to strengthen him, reduce the spleen, and
improve the quality of the blood as much as possible.

I should now mention that, on submitting my opinions on the
case, with the mode of treatment employed, by letter, to an eminent
professional brother, Doctor Fiddes, of Kingston, that gentleman—
who occupies, and deservedly so, in the estimation of the public

and of the profession, the distinguished position of "head" of the surgical profession in Jamaica—did me the honour to approve fully af my views and treatment. He advocated, as the last resource, and as almost the only chance of saving the boy's life, a step which I had often before recommended in vain, viz., the boy's removal to a colder climate, if his strength would admit of it.

On the third of October I tapped him, and removed 10½ quarts fluid. The boy bore the operation, which was performed with great rapidity, well. A flannel bandage, cut into tails at both ends, which were held on each side by assistants, and drawn tighter as the fluid escaped, kept up a steady and even pressure; and before many minutes had elapsed, the abdominal cavity, full before, even to bursting, had emptied itself almost entirely. A little champagne given; the lips of the puncture sealed up close with court plaster; a pillow of soft lint being then placed over all; the bandages drawn down, and carefully and evenly adjusted, and its ends sewn over each other (for a knot would have exerted injurious pressure, and have caused pain). All this being done, the boy fell asleep with a sigh of relief.

Bandaged as he now lay, the enormous size of the spleen was apparent, even to the eye. It projected as an enormous tumour, occupying the greater portion of the left side of the belly, pushing out the bandage before it; while the belly, on the opposite side, was sunken and flat.

The condition of the removed fluid was equally striking. It frothed up into a dense mass of foam, which did not subside. I had no means of ascertaining its specific gravity; but, when I add that, on a portion of it being boiled, it was found to contain almost one-third of solid albumen, it will be seen that its density was high.

I need not enter further into the treatment of the case than to say that the boy was up and about in a couple of days; that he had a good appetite; and that he continued to take his iron and quinine frequently, and a draught of nitre in some gin toddy at bed time. I persuaded his father to remove him, a week after, to the sea-side, where he could have warm sea-baths, and breathe an abundant supply of pure ocean air; while he would have, at the same time, the benefit of the combined skill of the medical men of Kingston.

Before he left my charge—and I saw him, for the last time, five days after he had been tapped—the fluid had again formed in the cavity of his abdomen, to the extent of, at least, four quarts; so

that the prognosis to be formed, in regard to his ultimate recovery, is not a very cheering one.

I shall now proceed to make some general remarks on this case, and

On the Spleen and its Functions.

In the foregoing case there has been always an extreme want of colouring matter in the general mass of the blood. The boy is white and chlorotic looking—like faded wax—and he has been so for the past nine years. Were it possible to examine his blood in the field of the microscope, it would be found to abound in white corpuscles, and to be greatly wanting in solid constituents. This is, in fact, a case of aggravated leucocythemia; and, perhaps, as pure a case of this affection as has ever been seen. During its whole progress, quinine, and the various preparations of iron, given in different forms, as they seemed to be required, and changed when the stomach appeared to prefer one preparation to another— which have usually such an effect in improving the quality and colour of the blood, and enriching it with solid matter, had not, in this case, the full effect generally expected from their use. And why? Because the spleen was powerless and inactive; incapable, in fact, of doing its usual dnty, *i.e.*, of maturing red corpuscles, and supplying them to the general mass of the blood.

I have never heard this boy complain of the pain usually felt by chlorotic people, in the region of the spleen; unless, indeed, when the organ was struck sharply by the point of the finger in making an examination. Granting that the function of the spleen is that of maturing red corpuscles, and of supplying them to the general mass of the blood, the organ, in this case, has not done its duty, although it has been aided and stimulated, in every possible way, by blood-enriching tonics frequently administered.

The fact of this child having lived and grown to be a big boy of twelve years of age—all the while looking pallid and waxy, and more especially so when the spleen, from miasmatic or other causes, appeared to become increased in volume; all this, most assuredly, tends to prove that the function of the spleen is essentially that of supplying colouring matter to the blood, and, through it, to the tissues generally.

In this case, the organ, from its enormous size and its extreme hardness and lobular condition, must have lost, almost entirely, and that years ago, its functional use in the animal economy. It

does not supply blood rich in red corpuscles to the system, for the lips are, and have been for years, very pallid, without, apparently, a particle of colouring matter in the blood circulating through them; and the cutaneous surface, generally, has had, for the past nine years, a faded shining appearance.

Any scratch, too, or sore on the child's body would continue in an indolent, unhealthy state; and should granulations at last spring up under the blood-improving powers of iron and quinine, they would be pallid and flabby, showing very little determination to coalesce.

The theory that the spleen acts as a diverticulum for the superfluous blood of the system, and that this is its main use in the economy, receives a severe blow from facts observed in this case. Here we have an enormous, indurated, and lobulated organ, at all times with its capsular covering and processes so much distended, as to be incapable of further sudden distention, or slackening, and, consequently, incapable of receiving or retaining any sudden accession of blood introduced into the circulation, or thrown back upon the spleen itself during any temporary congestion of neighbouring organs and vessels.

The sudden enlargement of the spleen, observed after the process of digestion has advanced as far as the formation of chyle in the duodenum, appears to me to be dependent more on the blood of its own vein being sent back upon the spleen, by pressure of the duodenum and its contents upon it (the vein), than upon any sudden accession of blood to the system at the completion of the process of digestion.

I speak now of the healthy state; but, of course, in congestion of the liver or stomach, or in any arrest of the circulation through the portal vessels, the blood must be thrown back, and is thrown back—from the absence of valves to prevent it—upon the spleen, and then congestion of the latter organ occurs as a matter of consequence.

In this very case the enormous hardened mass into which the organ has been converted, I doubt not, maintains and enlarges its own proportions, and keeps itself full always to distention, by exerting, *per se*, continuous pressure on the vena portæ, thus driving back the blood directly on the spleen, through the splenic; while, at the same time, it keeps up a steady distention of the mesenteric veins; and, as a natural consequence, causes a constant inpouring of sero-albuminoid fluid from these vessels into the

abdominal cavity.   As an additional proof of the truth of the fore-going statement, I would add, that for some time past, the surface of the belly has been covered with an extensive network of dis-tended veins, which ramify in every direction, and clearly show by their numbers and distended condition, an obstruction to the flow of blood upwards through the portal vessels.   This I consider to be the pathological explanation of the case, and to account fully for all the symptoms, and I have no doubt but that the profession will fully support me in taking this view of the matter.

In corresponding with Doctor Fiddes, of Kingston, who has now charge of this case, I have proposed that some mechanical apparatus should be made by which the spleen could be lifted from off the vessels behind, and injurious pressure on them thereby prevented.   For instance, a bandage could be made, with a firm cup-like cavity, the convexity of which might be made to press on the tumour from behind, and thus to raise the spleen, and push it to the front.   This suggestion is, at any rate, worthy of trial; and I make it, leaving to the profession to put it in practice in similar cases, according to circumstances, and to report on its value.

3.—*Case of Spinal Meningitis, Treated by Quinine and Opium, with Mercurial Inunction; Recovery.*

Mrs. E., a married lady, aged fifty, had been complaining, for some days, of a very severe pain in the back, increased, by motion, over the lower dorsal vertebræ.   She had, about six months before, when on a visit in another part of the island, suffered from a prior attack, not by any means so severe, according to her husband's report, as the one I am about to describe, of spinal irritation.

Warned by previous experience, she immediately retired to bed, and took measures to clear out the bowels.   I believe she took a full dose of calomel, with a grain of opium in it, and that she followed up this, the day after, with some senna-tea.   At the same time she applied a good-sized blister, much too large, however, over the seat of pain.   The *primœ viœ* were, I believe, well cleared out, but with no relief to the pain in the back, which continued to be very severe, while the stomach was exceedingly irritable.

On the second night after the accession of pain she tossed about the bed, and had an uneasy troubled sleep, complaining, at times, of severe cramps in her legs and thighs, all shooting from the back. Friction was employed, but all to no purpose.   At midnight, she cried out, "a fit—a fit!" and immediately she became violently

convulsed over the whole body, her trunk being bent forwards in a
state of perfect opisthotonos.   These convulsions recurred several
times before morning, each fit being more severe than the other
preceding it, until she became quite exhausted.

I saw her about seven o'clock, a.m., when the preceding history
of symptoms was related to me.   I found her in a comatose state,
with the pulse small and weak, skin clammy, and frequent sub-
sultus.   The tongue appeared to have been a good deal lacerated,
although every care was said to have been taken, and had been
taken, to prevent it.

There was evidently no time to be lost if a recurrence of strong
convulsions was to be prevented.   I saw, however, that I had a
good foundation to build on, in as much as the bowels had been
well cleared out, and I had an open blister on the back for local
applications.   On looking at the latter, I was horrified that such an
extensive surface had been blistered—and such a blister it was!
I pause here to state, that I had no doubt but that the extreme
irritation caused by this large raw surface materially affected the
severity of the attack.

At least four grains of powdered opium were rubbed up with
about a drachm—for there was no time to weigh one or other—of
mild mercurial ointment; and this was quickly spread and applied
to the raw blistered surface.   Frictions to the legs, and warmth
applied, by mustard cataplasms and blankets, to the legs and thighs,
were also enjoined.   In the meantime I had weighed and made up
some powders, each containing two grains of quinine and one grain
of opium.   I directed that one of these should be given every hour
during the day.

The result of the above treatment was that the muscular
twitchings ceased entirely for many hours.   In the evening,
however, she again became restless—her muscles twitched, and
convulsions were imminent.   A fresh plaster of opium and mercurial
ointment, with even a greater proportion of finely-powdered opium
in it than before, was at once applied, and a large warm poultice
was placed over all.   Frictions again; and warmth applied to the
limbs, while cold applications were kept to the head, all combined
to ward off the attack.

Still she continued restless, and, although opium had been used
so unsparingly during the day—locally applied and otherwise—I
now gave her a full dose of thirty drops of Battley's sedative.   Her
skin then assumed a comfortable warmth, and she slept quietly
throughout the night.

On the next morning she was quite calm and collected, and felt no other unpleasant sensation, except that of extreme exhaustion. She said that she felt " miserably weak."

She had not remembered anything that had occurred since her sensations immediately before the first convulsion, when she said she " felt that she was about to have a fit."   I now continued to apply a weaker preparation of the opium and mercurial ointment, with moist heat over all, in the shape of a poultice, when she complained of pain in the back or limbs; and the powders of quinine and opium were now given, in the proportion of one every third hour.   Still she continued to have, at times, ugly sensations, and a terrible dread of approaching convulsions.   Pain in the back was always relieved by moist heat, and an opiate plaster, applied to the still raw blistered surface.

I continued to give a few drops of Battley's sedative at bed-time.

It appeared strange to me that the mercury did not touch the gums, but I was very glad of it on account of the lacerated condition of the mouth.   On the third day of my attendance, however, the mercury began to run off by the bowels, and a very troublesome diarrhea set in.   I failed to stop this with chalk and catechu, combined with carminatives; and lead and opium, although given frequently, both by the mouth and by enema, had not the slightest effect in arresting this troublesome complication, which now, in reality, became very alarming.   Port wine had been frequently given since the occurrence of this debilitating diarrhea; and, in addition to the lead and opium, she continued to take opium with quinine, and to have opium also applied to the sore on the back; still the watery discharges continued.

At this stage of the case I remembered that on a former occasion I had immediately checked a sharp attack of over-purgation by the administration of a single twenty-grain dose of compound powdered kino, and, accordingly, I now prescribed it in this case.

Two doses arrested the discharge, and that within a few hours, and it never returned.   The immediate effect was both gratifying and surprising.

I shall not pursue this case further than to state that this lady fully recovered.   I have now sent her to the baths at Raetown, near Kingston, for sea bathing, where I have no doubt she will fully recover her health.

I have recorded this case in order to be able to show what great results may be obtained from the free exhibition of quinine, and

opium, and mercury combined, in spinal affections.   This lady took enormous doses of opium, repeated, too, at frequent intervals; and the drug was introduced into the system as well by inunction, combined with mercury, over a raw surface, at the most painful part of the spine.   And yet, although administered so freely, it did not produce a single bad symptom.

I should recommend in urgent cases the application of the actual cautery to the most painful part of the spine, in order that in addition to the immediate effect produced by cauterization, a raw surface might be at once obtained for the local application of mercury and opium at the very spot where the *fons et origo mali* lie.

In this case I had an extremely raw (but, unfortunately, rather an extensive) surface ready to hand for the application of local remedies; and it will have been observed how the application of finely powdered opium to this sore succeeded in warding off an impending convulsive seizure; and how, at a subsequent period, muscular twitchings and extreme restlessness and anxiety were at once quieted by the same means being adopted.

Had this lady's mouth not been so much cut up and injured I should have combined calomel with opium and quinine; because I believe that the sooner we get the system under the influence of mercury in such cases the better; and that for obvious reasons the prevention of organic change being the most important.

One more remark I would make in reference to this interesting case.   The complication of diarrhea, and its persistence, notwithstanding the full and oft-repeated exhibition of opium, surprised me, and its non-debilitating effects, as observed after in the comparatively-speaking speedy convalescence which resulted, surprised me more.   Certainly such cases have an extreme tolerance of opium; and does not this fact alone indicate its free exhibition?

In conclusion let me offer that meed of praise to the French physicians, M. Gaussaud and M. Chauffard, to which they are entitled for their writings on this fatal disease; and for their suggestions in regard to the most correct mode of treatment to be employed.   Gaussaud, regarding the disease as a kind of spinal fever, treated it with purgatives, and oft-repeated doses of quinine, and he found that under this treatment only two out of 162 soldiers, attacked by the disease, died.

Chauffard found opium, in full doses, given internally, and in some cases combined with quinine, to be most effectual in his practice.

Our own esteemed and lamented Dr. Mayne, of Dublin, during the epidemic of the disease in Ireland, in 1846, found the mercurial plan, aided by blisters and mercurial inunction along the spine, to be the best and most successful mode of treatment.

To the combined treatment, as recommended by all three, I subscribe; strongly urging, at the same time, the immediate and powerful aid to be derived from the continuous application of opium, which may, with benefit, be combined with mercurial ointment, to a raw surface, or raw surfaces, along the spine.

The unpleasant question must now be asked:—Will this lady, at future periods (for it must be remembered that she has had two attacks, at different times, already) be subject to recurrent attacks of this dangerous spinal affection?

I should have mentioned, in a former part of this paper, that Mrs. E. had, prior to her first spinal attack, been a martyr to acute rheumatism; and that she has always been a woman of the most sanguine and excitable temperament.

4.—*Case of Double Hepatic Abscess, occurring as the Result of a Prolonged Attack of Dysentery; the Fluid Evacuated through a Puncture made in the Abdominal Wall, after Union had been Artificially Established between the latter and the Liver; Recovery.*

Several years ago, a Mustee[a] man, named Archibald Morrison, aged about forty-five, was under my care for chronic dysentery, from which he had been suffering for some time, and by which he had become reduced in bulk, and miserably weak. He suffered much from a constant dull aching pain in the right side and shoulder; while his yellow skin became still more yellow, and his conjunctivæ discoloured from biliary infiltration.

When he had been under my care for some time, and pain and swelling, in the hepatic region became more urgent, I made a careful examination of his right side, which appeared considerably larger, in the hypochondriac region, than the left, even before his clothes had been removed.

The extensive dulness, on percussion; the deep-seated, dull, dragging pain, and sense of weight in the right hypochondrium; the short breathing, and dry cough; coupled with the fact of his having suffered from a pre-existent and prolonged attack of chronic

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[a] A Mustee means one born of parents one of whom is a white person and the other a mulatto—the latter being half white and half black.

dysentery—all pointed to the liver as being the diseased organ. It was blistered; mercury was given, but with care, as the man had been previously wasted, from his dysenteric affection; and nitro-muriatic acid, which is my favourite tonic in cases of sluggish liver, and after fevers, was frequently administered.

I soon, however, discovered unmistakable signs of the formation of an abscess. A tumour projected from beneath the ribs in front, of stony hardness in its circumference, but, evidently, softer towards its centre. Rigors, and hectic sweats at night, with a mitigation of the acute pain, and daily increasing fulness beneath the ribs, confirmed the diagnosis; and I became certain that a large abscess had formed.

I will admit that I had very little hope for this poor fellow; but I felt it to be my duty to do all I could to save him. He lived a very short distance from my residence, and I was, therefore, able to see him constantly. I brought his case to the notice of the good rector[a] of the parish; and, between us, we supplied him with delicacies, and with a constant supply of good port wine.

I daily painted the circumference of the tumour with a very strong solution of nitrate of silver, having first ascertained that there were no adhesions, and that the abdominal wall could be rubbed and moved freely over the surface of the tumour at all points. Adhesive inflammation set in, after a time, in the ring formed by the application of the caustic, which was, nevertheless, steadily and continuously applied for at least four weeks. The centre of the tumour became, every day, more soft and fluctuating; and the abdominal parietes, at this point, became thinner and thinner. I could not move the abdominal wall here now. It appeared to have become firmly attached to the organ beneath; and the time had come to evacuate the abscess. Accordingly, and not without some degree of anxiety, I punctured the abscess with a long-bladed knife, and immediately a fetid stream issued forth. At least a quart of thin, yellow, horribly fetid stuff came away at the time. The abscess continued to discharge for, I believe, three weeks after; and the swelling gradually subsided. The man continued to be well fed, and to take nitro-muriatic acid three times a day. He perfectly recovered; and I frequently see him, now, working in his cane field; nearly four years having elapsed since the abscess was opened in his side.

[a] The Rev. C. H. Hall.

In conclusion I have to add that the dysenteric attack, and the formation of the hepatic abscess in this case, stood, in the relation to each other, as cause and effect.   It can be easily imagined how readily a prolonged attack of dysentery, where pus is freely secreted by the mucous membrane of the rectum, may terminate in the formation of one or more abscesses in the liver.   The explanation is very simple.   The internal hemorrhoidal veins become charged with pus globules, which are carried up, by the portal circulation, to the liver, where they lodge and multiply; and an abscess, or abscesses, more frequently, is the result.   Since writing the foregoing, I have this day (Oct. 22nd) seen and examined Archibald Morrison.

I find that there were two distinct abscesses, which I opened, within the ring of adhesion, at different times, a large quantity of pus being discharged on each occasion.   The liver appears to have acquired its natural size; and the abdominal wall, in front of it, is considerably puckered and drawn in; showing clearly, and without doubt, complete union between it and the organ beneath.   The cicatrices of the two openings, made by the knife, are very apparent, and have an extraordinary appearance.   They are situated in the very centre of the body, between the umbilicus and the ensiform cartilage, being about two inches distant from each other; and each having a depression, or pit, in its centre.

The man tells me that he enjoys very good health, with the exception that he sometimes feels an uneasy sensation in the right side, which, indeed, is not to be wondered at.

5.—*Case of Empyema, the result of a Subscapular Abscess having Burst into the Cavity of the Chest; Puncture through the Walls of the Abscess; Recovery.*

A case of a child, of three years of age, was brought to me some months ago, by a naval medical friend, Dr. Goodman, of Her Majesty's Royal Naval Hospital, Port Royal, who happened to be in my neighbourhood at the time.

This may have been, originally, a case of abscess, with the supervention of empyema, as the consequence of such abscess having burst into the cavity of the chest.   But we had no data to go upon, the persons who brought the child for medical advice having known nothing, or comparatively nothing, of its previous history.

When I saw the child it had an enormous fluctuating tumour in the subscapular space on the right side.   This was easily recognized

to be an abscess.   During the act of inspiration it became exceed-
ingly firm and prominent, while it became less dense when air was
expelled from the chest.   This fact did not favour the prognosis,
that the abscess was connected with the pleural cavity; for, in such
cases, the tumour is, generally speaking, observed to become full
during expiration, and to recede during inspiration.   Respiration
was painful, and the chest, on the affected side, looked considerably
fuller than on the left

Physical signs could not tell us much, for the child yelled and
screamed every time we approached it—so much so, that it became
impossible to gain any information in this way.   It was a perfect
little tyrant; and, unless held forcibly down, could not be kept in
one position.

An exploring needle, plunged into the midst of the tumour,
brought out pus; and, on this opening being enlarged, a stream of
fetid matter burst forth, *e pleno rivo*, intermixed with bubbles of
air.

At each effort at expiration, the force of the stream became
increased, and matter continued to flow until, at least, a pint and a
half had been evacuated.   A pad of lint was now placed over the
opening, and secured there, with the intent that it should act as a
valve—by adhesive straps—and a bandage, passed around the chest,
kept the parietes of the abscess—which, before this expedient was
adopted—flapped, as air rushed in and out of the opening, together.

This child is now in good health, having, strange to relate,
recovered rapidly, and without a single bad symptom.

The question now to be asked is—was this, originally, a case of
abscess, with the subsequent supervention of empyema, as the conse-
quence of such abscess having burst into the pleural cavity? or was
it a case of empyema, in the first instance, with the formation of an
abscess in the subscapular region, from the matter having found its
way outwardly afterwards?

I am inclined to believe that the former is the true interpretation.
It is not uncommon to find nature attempting a cure by the forma-
tion of subcutaneous abscesses on the front of the chest, in cases of
empyema; but the formation of such an extensive abscess on the
back, and over and beneath the scapula, must be a rare occurrence,
if, indeed, it has ever occurred at all.

In this case, the tumour was of large dimensions, and could not
be emptied by pressure; and I believe the true explanation of the
case to be that given at the heading of this article, viz.—that this

was a case of empyema occurring as the result of a subscapular abscess having burst into the cavity of the chest.

6.—*An Account of Four Cases of Strangulated Hernia, each of which presented some point of interest.*

The first case of strangulated hernia to which I shall refer occurred in August, 1858. A gentleman, named H. H., had performed a long journey, rapidly, on horseback; and on some portion of the road, on making a sudden turning into a negro village to avoid a falling shower, he felt something "give way" in his right groin. On his return home he felt sick at the stomach, and complained of great pain in the region before referred to. I saw him next morning, and immediately discovered a strangulated femoral hernia on the right side.

I tried the taxis, and manipulated the tumour for some time, but it was immovable, tense and painful as it was. These symptoms being increased by constant vomiting, he could hardly bear it to be touched. I then tried a tobacco enema, giving him at the same time small doses of tartar emetic and opium, often repeated. A warm bath, in addition to the foregoing, and in which he was kept for a considerable time, helped to lower him, and to relax the spasm, and he lay weak and helpless on the bed.

Again I tried the taxis. I now distinctly felt that some portion of the tumour passed up into the abdomen, but the remaining part, and that the greater, remained fixed in the femoral ring, and could not be moved therefrom by any means other than operative.

He still suffered from excessive pain, vomiting, and all the symptoms of strangulation, and his bowels continued to be constipated. Accordingly I determined to cease any further efforts at reduction by the taxis, and I proposed, the aforesaid symptoms continuing, to operate. But this he would not hear of until a consultation could be held, and we had to send thirty miles in one direction, and twenty in another, to obtain assistance. In the meantime I had to content myself with giving this gentleman opiates to quiet him, and to enable him to obtain some rest. My two medical friends arrived early the next morning, one being Dr. Robert Oates, who practises in the lowlands of this parish (Clarendon), and the other a countryman of mine, whose name I mention with respect, viz., Dr. Frazer, an army surgeon, then connected with the Second West India Regiment, stationed in Spanishtown.

I should mention here that the exhibition of opiates gave my

patient a fair night's rest, and that by morning, and before my medical friends came, he was in a very different condition to what he had been on the day before.   He was stronger and in much less pain, and vomiting had ceased.   There only remained the tumour as before, tense and painful to the touch, and the bowels had not been evacuated.   I thought, however, that the good symptoms counterbalanced the bad, and I determined to put in my veto to immediate recourse to operative measures being attempted, until a bold effort had been made to find out whether or not I had returned the intestine the day before.   I became now very strongly of opinion, from the fact that vomiting had ceased, and the remembrance that I had returned some portion of the contents of the tumour by the taxis, that this had been originally a case of entero-epiplocele, and that I had returned, probably, as much of it as consisted of intestine, leaving omentum simply behind to be dealt with.

As I said before, however, there remained a tense, painful, and immovable tumour, an abdomen swollen from tympanites, and tender on pressure, and obstinate constipation.   I mentioned my views in regard to the return of the intestine, and stated that from the cessation of the more urgent symptoms, and especially of vomiting, and the increased strength of the pulse, I was fully of opinion that the strangulation of the gut, at any rate, had been removed.   I proposed then to my friends, on their arrival, that we should give Mr. H. a heroic dose of castor oil, in half a tumbler of champagne, as this would prove in a very short time, whether the bowels were patulous or not.   This was agreed to, and within an hour my prognosis was fully verified.   The oil acted enormously, and removed quantities of pent up wind and feces from the intestinal canal.

Here was, without doubt, a case of entero-epiplocele, converted by the taxis into a case of epiplocele, which, although painful and troublesome, is not, by any means, so dangerous or alarming as where the intestine itself is strangulated.   The tumour became hot, swollen, inflamed, and very painful, causing fever, and keeping this gentleman in his bed for many days after.   Leeches, locally applied, however, and a full course of mercury with opium warded off peritoneal inflammation, while change to the sea-side restored him to ultimate health.

I should add that, after some months, the tumour became entirely absorbed.   The femoral ring, however, remains to this day entirely blocked up, and closely sealed against the possibility of any future

descent of a hernia, and I need not say that the irksomeness of a truss is dispensed with.

The second case was one of strangulated inguinal hernia, in which symptoms of strangulation of the intestine continued after the hernia had been reduced, and the intestine returned to its place in the abdominal cavity; operative measures, for the relief of the patient being ultimately required, and the case itself terminating in complete recovery.

A young negro stonemason, aged about twenty-three, had been lifting a heavy bar of iron, when he felt something "give way" in his side. A tumour appeared in the inguinal region, and soon after all the symptoms of strangulation set in. He was removed to Chapelton, and I saw him some hours after.

He had direct inguinal hernia. I tried the taxis, and succeeded, after a time, in reducing the tumour, and in freeing the man from the very great pain from which he had been suffering. Having applied a pad and a bandage, and given him an opiate, I took my leave.

Two days after I was again sent for, when I found this man, whom I had fully relieved two days before, suffering again from all the urgent symptoms of strangulated hernia. He was uneasy and restless, while his abdomen was hot and painful to the touch. He had constant vomiting, and he complained of an acute dragging abdominal pain. His pulse was small, sharp, and quick, and his face wore a very anxious expression.

With regard to the tumour itself, it appeared to have returned to a small extent, for I could feel a firm, inelastic protrusion at the abdominal ring. This was not, therefore, a case of reduction *en masse*, for the hernial tumour was still there, and now immovable. The finger could not be passed into the abdominal ring, as this was entirely blocked up by the protruding tumour.

There was no use now in attempting the taxis a second time, and, accordingly, I had no other course left to me than immediately to have recourse to the knife. Here, I would mention, the extreme delicacy of the position in which I was placed; and, unfortunately for myself, it is by no means an uncommon one in the mountains of Jamaica.

I could not call in anyone to advise with, or one with whom I could share the responsibility of the case. Even the village dispenser, Mr. Henry Lyon, who is frequently a great help to me in keeping up the administration of chloroform in operations,

was sick, and I had to cut this man for strangulated hernia in a dark room, and positively without any other help than that of brute force to hold him down in case of struggling.

Having given chloroform, I laid open the parts in the usual way until the sac became exposed, as carefully, and at the same time, as rapidly as possible. No intestine appeared to be included in the sac, and I freely laid it open, giving vent to about an ounce of bloody serum which it contained. The finger passed up easily through the abdominal ring, into the abdominal cavity, and I was positively at a loss to know, at this stage of the operation, why I had operated.

I only found, what has often been found before in such cases, viz., a quantity of fluid in the hernial sac, which had been secreted in the latter after the reduction of its more important contents two days previously.

On enlarging the opening, however, and passing my finger freely into the abdominal cavity, I hooked down something which came within reach; and this proved to be very healthy-looking intestine. I drew this down freely, and examined it carefully; when, some inches up, I found, to my great relief (for I began to fear that I had performed a needless operation), a deep sulcus separating one part of the gut entirely from the other. The intestine was much congested and looked, as if it had been tied, at this part, with a tense cord. It bulged out on either side of the constriction.

This band being carefully removed by a blunt pointed bistoury passed beneath it, the intestine resumed its usual shape, and was easily returned into the abdomen. At this part of the operation I found the poor fellow looking me full in the face, fully recovered from the effects of chloroform. He complained of no pain; but made a remark, which, while it showed that he cared for my anxiety about him more than for his own condition, caused the negroes present, and even myself, to laugh. Without preface, he called to some one standing by, " Wipe the doctor's face." I presume I was pouring with perspiration in that hot room. This is an instance of how a negro can bear pain; but, again, I have seen them scream and yell for little reason.

The wound in this man's groin healed up entirely by the first intention; and, within a week, he was up and about.

He recovered perfectly; and he has never since had occasion to wear a truss.

The other two cases I shall only refer to casually. One was

that of a gentleman, Mr. MacC., aged thirty-two, a professional photographer, who happened to be visiting Chapelton in October, 1865, at the time when I and the other gentlemen of Upper Clarendon were keeping watch, night and day, at the Court-house, as volunteers, for the protection of our homes, and of the honour of our wives and children, during that terrible ordeal through which Jamaica passed.   Mr. MacC. had ridden down to the river to bathe, without having taken the usual precaution of putting on his truss—for he had an inguinal hernia previously— when, on making use of exertion, a large mass of intestine came down into the scrotum, and soon became strangulated.

I was quickly with him, for he lodged very near the Court-house, on the floor of which I had to sleep for many a night during the rebellion; and I tried the taxis, but in vain.   He vomited incessantly; and the scrotum swelled out to such an extent, the wind gurgling through its contents, at each sickly gulp of the weak man, to such an extent that I thought the inflated intestine would have burst.

Again and again I tried the taxis, and failed.   A stout drill-sergeant placed him with his heels over his (the sergeant's) shoulders, at my suggestion, in the hope that the intestine might, in this way, be drawn back into the abdominal cavity—but in vain.

I now made Mr. MacC. lie with his hips against one of the bottom posts of the bed, both his legs being supported against this post, between it and the wall.   His legs were thus at right angles with his body; and he was placed in the most favourable position for the taxis, or for the gradual return of the contents of the hernial tumour.   I left him for a little, and, having given him an opiate, he had some rest; but, in the meantime, the stricture had become relaxed; and a portion of the protruded intestine had returned, by means of its own weight, into the abdomen.   The remainder was soon easily returned by the taxis.

The fourth case bears no point of interest, except that the plan of placing the patient in the position described in the preceding remarks, in this instance with one leg only, on the affected side, placed against the bedpost, enabled me to return an inguinal hernia as large and as hard as a cricket-ball, into the abdomen.

I never saw a hernial tumour so hard and unyielding as in this case; and yet the plan adopted, without any help from chloroform, tartar emetic, tobacco, the warm bath, or any other auxiliaries,

enabled me to overcome all difficulties, and to reduce this hard and exquisitely painful tumour, in a few minutes, by the taxis alone. Thus, a most unpromising case became, by this simple expedient, one very easily managed indeed.

Art. XI.—*On the Diagnosis of Renal from Ovarian Cysts and Tumours.* By T. Spencer Wells, F.R.C.S.; Surgeon in Ordinary to Her Majesty's Household; Surgeon to the Samaritan Hospital; &c.

During the few years which have passed since the revival of Ovariotomy in England, great attention has been paid to the diagnosis of abdominal tumours; and a knowledge of their distinctive characters is becoming so general, that mistakes which were formerly not uncommon are now comparatively rare. The diagnosis of ovarian tumours from pregnancy—from fibroid or fibro-cystic tumours of the uterus—ascites—tubercular or cancerous affections of the peritoneum—other forms of intra-abdominal cancer—hydatid cysts in the liver—iliac or pelvic abscess—is made repeatedly, in hospital and private practice, with a readiness and certainty which render a mistake quite an exception in a long series of accurate opinions. But exceptions still occur; and men of great experience must occasionally admit that an exact diagnosis is impossible. In other cases, it is only after an explanatory or incomplete operation, or after the death of the patient, that a mistake is discovered, and the means of avoiding it for the future are learned. Such a case has recently occurred in my own practice—a cyst, believed to be ovarian, proving to be a cystic degeneration of the kidney; and I avail myself of the earliest opportunity of bringing this case before the profession, with a few remarks on other cases in which I have known renal to be taken for ovarian disease.

The first case of the kind which came under my care was one of

SOFT CANCER OF THE RIGHT KIDNEY

in a girl only four years old. She was sent up from the country to me, in 1862, supposed to be suffering from ovarian disease. Her appearance is very well shown in the annexed woodcut, copied from a photograph, taken by Dr. Wright, while she was in the Samaritan Hospital.

The diagnosis in this case was made without much difficulty, although the urine was quite normal. The growth was extremely rapid; hardly six months from its commencement to its fatal termination—when the diseased mass weighed between sixteen and seventeen pounds. The tumour occupied the whole of the right side of the abdomen, bulging backwards in the right loin. It was uniformly elastic, but not fluctuant. The intestines were pushed downwards, and to the left side. The rapid growth, and the absence of fluctuation, were, of course, strongly against the opinion that the tumour was ovarian; while the rarity of ovarian disease in young children, and the comparative frequency of renal encephaloid, led to a diagnosis which was confirmed by a puncture with a fine exploring needle. A few drops of reddish serum were obtained, containing nucleated cells of most varied size and shape. I sent the child home, with a note, to Dr. Williamson of Nantwich, expressing my opinion that the tumour was a mass of soft cancer, and that the right kidney was the most probable seat of the disease. This proved to be correct. Dr. Williamson sent me the specimen, and I exhibited it at the Pathological Society, in December, 1862. The whole kidney was infiltrated with encephaloid. Although so enormously enlarged, the shape of a normal kidney was distinctly

preserved.   Its surface was soft and elastic, in some spots giving a sense of deep-seated fluctuation; but no cyst was found, nor were there any marks of suppuration or hemorrhage.   Coils of small intestine adhered to its inner and under surface.   The ureter was completely occluded by the pressure of the tumour.   The left kidney was quite healthy.   Thus the normal condition of the urine was explained.   The diseased kidney added nothing to the contents of the bladder, and the healthy kidney supplied only normal urine.

The following remarks on this point by Dr. Roberts, of Manchester (*Urinary and Renal Diseases*, p. 444), are well worthy of serious consideration.   He says:—" The presence of cancer cells in the urine is a sign which usually figures prominently in the catalogue of symptoms of renal cancer, but its value is very doubtful. In all the later cases, especially when there was hematuria, the urine was carefully examined for cancer cells, but without success. Rosenstein mentions a case in which a cancerous villus was actually found projecting into the ureter, yet no cancer cells could be detected in the urine during life.   It is by no means an easy matter to identify cancer cells in the urine, in consequence of their similarity to the transitional epithelium of the pelvis and ureter.   .   .   . In two examples of renal cancer, with hematuria, which I have had an opportunity of observing, repeated and careful examination of the urine failed to discover the presence of cancer cells.   Mr. Moore (*Med. Chir. Trans.*; xxxv., 466) believes that he succeeded in identifying cancer cells in the urine drawn after death from the bladder of a man in whose kidneys cancerous nodules were found; but his description rather accords with the appearance of the epithelial cells which are always freely detached from the vesical mucous membrane after death."

Whether renal cancer be observed in children or in adults— whether it be or be not accompanied by hematuria, or by the presence in the urine of albumen, or of epithelial cells from the ureter and pelvis of the kidney—whether the progress of the disease be slow or rapid—whether there may be much, little, or no pain, or emaciation, or gastric symptoms—or great or little effect upon the general health—the abdominal tumour is the most prominent characteristic of the disease.   As Bright observed (*Abdominal Tumours*—Sydenham Society's Edit., p. 199):—" The enlargement shows itself much more towards the anterior part of the abdomen than towards the loins."   It is, however, more   or

less confined to one side of the abdomen and to the corresponding lumbar region, whence, as a rule it is immovable—and equally, as a rule, some portion of the intestines are fixed in front of it. But in one extraordinary case, an exception was found to both these rules. In the *Lancet* of March 18, 1865, a case is recorded in which an operation was commenced for the removal of a supposed tumour of the left ovary. The patient was in one of our general hospitals, and it was believed by the eminent physician-accoucheur who carefully examined her, and by the skilful surgeon who performed the operation, that " the tumour was ovarian, and that from its great mobility, and the absence of adhesions, its removal would be easy." Yet the uterus and ovaries were found to be healthy, and the tumour to be the enlarged left kidney, which, instead of being fixed, was movable—its peritoneal covering being elongated into a sort of mesentery, admitting of free movements— and instead of pushing the intestines before it, the descending colon and sigmoid flexure were behind it.

The *absence of fluctuation* is the leading sign by which cancerous or other *solid* tumours of the kidneys are distinguished from ovarian tumours; for it is extremely rare to find a large ovarian tumour in some part of which fluctuation cannot be detected. But in some forms of kidney disease fluctuation is as evident as in ovarian cysts. It was perceptible in the second of the three cases on which this paper is founded—one of

PYONEPHROSIS OF THE RIGHT KIDNEY, WITH IMPACTION OF TWO CALCULI IN THE URETER.

On the 16th of May, 1865, I was hurriedly called to see the mother of a patient upon whom I had performed ovariatomy successfully, the daughter telling me that her mother had a tumour like that which I had removed from herself. I found the patient, about fifty years of age, in excessive pain all over the abdomen, but greater on the right side and in the right loin; and I felt a hard tumour between the right false ribs and the right ilium, reaching forward to within an inch of the umbilicus, as shown in the annexed diagram. The patient was so ill that I could not get any sort of history from her. I prescribed a full opiate, and directed it to be repeated in smaller doses at intervals of an hour until the pain abated—hot poultices being also applied. On the next day she was much easier, and I gathered the following history :—
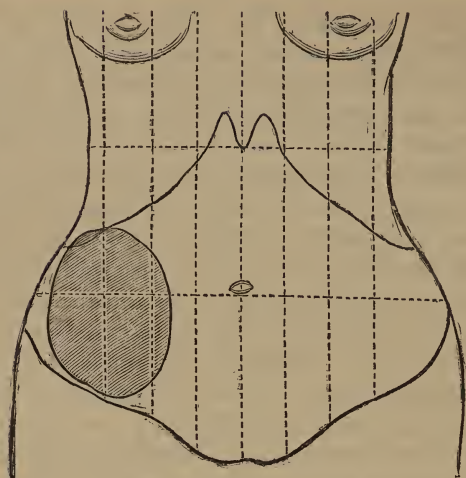
She was fifty years of age; had married when twenty-two; had borne five children. Her last child was seventeen years old. Before this last confinement her health had been very good. This labour was very protracted, the presentation having been transverse. Ever since, she had been subject at times to pain in the back and right loin. It used to come on suddenly, increase in violence, and produce shivering and nausea. After six or eight hours it would cease. Her urine at the time of the attacks was usually thick, with yellowish sediment; at other times it was clear. For five years such attacks recurred pretty regularly every six weeks. Then, after a more active life, they recurred more frequently, scarcely a week intervening from one to another. In 1860 the catamenia ceased, and the attacks became milder and less frequent, and she was entirely free for a year or more. In 1862 the pains suddenly recurred with more violence than ever. After great suffering for several hours, " a dozen or two of little stones, as large as a pin's head," were passed with the urine. From this time till the present attack she had been quite well. On the 8th of May, 1865, while out walking, she stumbled and fell upon her abdomen. She was lifted up, complaining of great abdominal pain. She got home, went to bed, and next day the pain was so great that she was unable to get up. During the next six days she passed a good deal of blood in the urine, and she perceived, for the first time, a tumour as large as a cricket ball in the right side of the abdomen. On the 15th, the pain, which had almost ceased, returned suddenly with

great violence, and I was sent for. She was much relieved by the opiate prescribed; and I made a more careful examination of the tumour. It could be felt as shown in the diagram, but its margins could not be made out very distinctly. They appeared to be overlapped, on the right by the cecum, and the left by small intestine. Wherever the tumour could be distinctly felt, it gave a dull note on moderately strong percussion, but a clear one on deeper pressure and sharper percussion. By pressure forwards with one hand on the right loin, and the other on the front of the tumour, a trace of fluctuation was detected. Pain was kept in check by opiates, and on the 19th of May there was a prominent point near the middle of the tumour; fluctuation being distinct, I inserted a very fine trochar in this point (which was midway between the umbilicus and right anterior superior spine of the ilium), and drew off between two and three pints of thin pus, by a syringe attached to the canula by an air-tight joint. The urine, before the tapping, had been clear; but the day after, it was found by Dr. De Mussy to be loaded with pus. On the 21st the late Dr. Ritchie reported that it contained a large quantity of pus altered by the action of the urine. On the 27th, notwithstanding this escape of pus through the bladder, the tumour was as large as before the tapping. I therefore tapped again, and after removing two pints of pus, left the wound unclosed. There being no discharge after two days, I inserted a laminaria tent, having re-opened the wound with the lancet.

A very free discharge went on for the next fortnight. At first it was purulent, but afterwards it consisted of clear fluid, which was found to contain urea by Dr. Leared. The pain ceased, and the general health rapidly improved. The urine became clear and free from pus. On the night of the 17th of June some abdominal pain came on, but soon subsided, and the discharge from the opening suddenly ceased. Urine was passed with smarting, and was again found to contain pus, mingled with a little blood. Early in the morning of the 20th of June great desire was felt to pass water. After much difficulty and pain, a calculus of uric acid and urate of ammonia, as large as a broad bean, and much of the same shape, was passed, and was soon followed by a second, of similar dimensions. Relief was immediate. On the 25th a boil was felt just at the seat of the former punctures. On the 27th it burst, discharging about two ounces of grumous matter. The patient now felt so well that she was able to walk about and enjoy herself in the

country. On the 1st of July there was still a little discharge, perhaps one ounce in twenty-four hours. The abdomen was everywhere clear on percussion; but on deep pressure a hard painless tumour, as large as an orange, was to be felt in the right loin. After a few weeks this could no longer be felt, and the patient has since remained perfectly well. I heard of her in December, 1866, as being in better health than she had been for years.

This case is in many respects very instructive. The patient probably had a tendency to deposit uric acid before her last labour. The effects of that protracted labour perhaps led to the train of symptoms which ended, for a time, in the passage of numerous small calculi. Then, in 1863 or 1864, two renal calculi began to form, and set up chronic pyelitis. The fall in 1865 dislodged the calculi, and they blocked up the ureter. The pus and urine accumulated behind the calculi, and distended the pelvis of the kidney into the cavity from which I removed the large quantity of pus at the first tapping; and it was not till the calculi passed on into the bladder and left the ureter free that the formation of pus ceased and the artificial opening closed.

I have twice opened peri-renal abscesses in the loin, and in one case removed a small renal calculus through the opening. But the case just related is the only one in which I have punctured the kidney through the abdominal wall. It was clearly a hazardous proceeding, but the danger of rupture of the rapidly increasing sac into the peritoneal cavity appeared to be so great, and the suffering was so excessive, that tapping appeared to be less dangerous than expectation.

The following case of

CYSTIC DEGENERATION OF THE LEFT KIDNEY

which was mistaken for a cyst of the left ovary, is not less instructive:—

On the 10th of October, 1866, a married woman, forty-three years of age, called upon me with a letter from Dr. M'Donnell, of Stoke Newington, containing a very full and accurate history of her case. She had been married 25 years, and had 9 children, the eldest being 23 and the youngest 4 years old. She had also had 1 premature birth, and 2 abortions; the last in 1861. Dr. M'Donnell wrote as follows:—" In April, 1862, she sought my advice for a hard swelling situated in the hypogastric and left iliac region, the size of an infant's head. Examination externally, and

per vaginam, convinced me it was an ovarian tumour. Mr. Solly confirmed this opinion on the 8th of May, 1863. In 1854 and 1855 a swelling was complained of, and had been the subject of conversation between husband and wife, but no advice was asked for at the time. Its situation was much as in 1863. Aching pain was felt, from time to time, in the tumour, without causing any alarm, from the time when it was first noticed by the patient herself. It had increased so much, in the early part of 1863, as to suggest the question of pregnancy. Some pain has, at times, been complained of in the lumbar region, and lower part of the abdomen, relieved by leeches, fomentations, &c. Leeches have been applied several times; the first time in November, 1863. In the Summer of 1863, the patient began to attend the Hospital for Women, in Soho-square, and became an in-patient in January, 1866, with a view to operation; but no operation was performed. She remained in hospital twelve weeks, her general health being then very bad, and she was much reduced in flesh and strength. After she left the hospital, the tumour increased in size, and extended to the epigastrium, and encroached so much on the chest as greatly to impede the breathing, and even prevent her moving about in bed. Assisted by Mr. Forman, of Stoke Newington, on the 4th of August, 1866, I withdrew, by tapping in the linea alba, two gallons of dark discoloured fluid, of the consistence of pea soup. The opening was made midway between umbilicus and pubes. The operation was well borne; the abdomen was entirely freed from fluid, the resonance being tympanitic everywhere, and no solid tumour to be felt in the pelvis. She recovered very favourably, and has been frequently out of doors since that time. The appetite, which had been entirely wanting for months previously, became, for a short time, very good. Her strength and spirits have much improved, though the cyst has re-filled."

It was rather more than two months after this tapping when I first saw the patient, and I then advised her to come into hospital before she became as much distressed as she had been before the tapping. She was admitted on the 17th of December, 1866. The tumour then occupied the position shown in the annexed diagram. At the upper and central part there was a patch of crepitus, giving the feeling of adhering omentum; and all down the front of the tumour, about an inch to the left of the umbilicus, was a cord-like ridge, which was taken by some who examined it for intestine, though it felt very like a large, long, and thick Fallopian tube. The
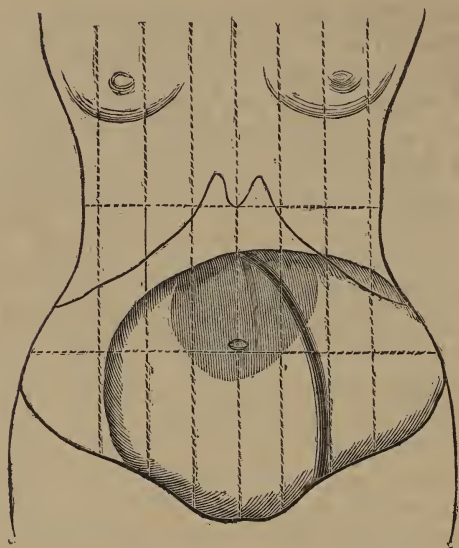
measurements were:—Girth at the umbilical level, 36 inches; from
umbilicus to ensiform cartilage, 9 inches; to symphisis pubis
7½ inches; to right ilium, 9 inches; and to left ilium, 9½ inches.
There was some mobility in the tumour, both vertically and
laterally. Fluctuation was distinct across the whole tumour, in all
directions. The left loin was dull on percussion, the right tym-
panitic. The uterus was high; the os hard and fissured, admitting
the tip of the finger; the cervix short. No part of the tumour was
below the brim of the pelvis. The catamenia was expected in a
few days. They occurred regularly every three weeks—lasting
five days. Dr. Junker examined the urine, and reported—" No
albumen; deposits—urates, mucus, and epithelium." She was sub-
ject to occasional nervous attacks, during which she was partially
unconscious. She said they began by palpitation. She had four
while in hospital, but they were regarded as hysterical, and attracted
but little attention. The heart and lungs appeared to be healthy.
The catamenia came on, and lasted a week, ceasing on December
29th; and on the 3rd of January, 1867, chloroform having been
administered by Dr. Junker, I made an incision five inches long,
extending downwards along the linea alba, from one inch below
the umbilicus. On opening the peritoneum, I at once found that
the hard roll, or ridge, observed running down the front of the
tumour, was part of the transverse and descending colon, adhering

closely by means of the meso-colon and omentum, both to the cyst and to the abdominal wall. I separated some of these attachments, in order to tap the cyst safely. On introducing the trochar, about fifteen pints of fluid escaped. It had the appearance of pea soup. When the cyst was empty, I made some further separation of omentum and intestine; and when passing my hand round the right side of the cyst, what appeared to be another cyst gave way, and between one and two pints of clear fluid escaped. I then found that the deep attachments of the cyst were too close to admit of separation; and after tying three vessels which were bleeding in the separated omentum, and cutting off the ligatures short, I closed the wound.

The patient rallied slowly from the chloroform, and complained of pain, which was relieved by an opiate. Two other opiates were given at night—the total quantity given amounting to 50 minims of laudanum. Three hours after operation a small quantity of clear urine was drawn off by the catheter. After this not a drop of urine entered the bladder. At 10 p.m., the temperature was 98·4; pulse 116; respiration 28. The next morning the pulse was 120, and very feeble; skin dry; temperature 98; respiration 30. She was comatose, but easily roused, and answered questions sensibly. The coma gradually became more profound, and she died thirty hours after operation.

On examining the body seventeen hours after death there was no *rigor mortis.* The wound had united well. There were about four pints of blood-red serum, and a small tea-cupful of blood-clot in the peritoneal cavity. The right kidney was enlarged, and very soft; the cortical substance very friable, pale yellow in colour. The calices and pelvis were much dilated, and the thin sac formed by this dilatation had given way longitudinally. A calculus, weighing forty grains, was in one of the calices, forming a perfect cast of the calix. The bladder was contracted, and empty. The uterus and ovaries were healthy. The left kidney formed the cystic tumour which is described as follows by Dr. Junker:—

" The left kidney formed a cyst larger than an adult head. It presented one large cavity, composed of several wide pouches, arranged vertically at one side of the principal cavity. The stroma which formed the external wall was of varying thickness; thicker and stronger at the base of the pouches; thinner and less dense around the main cyst. It had a serous external coat; at some places

hypertrophied, at others atrophied. Next a fibrous structure (fibrous capsule of the kidney). This was followed by what appears to have been the cortical substance of the kidney, and from which portions could be traced into the septa (the former columnæ Bertini) which separated the pouches (the expanded calices). The main cyst (the original pelvis) was formed by the peritoneal and fibrous capsules. The medullary portion could not be well distinguished by the naked eye from the thickened lining membrane. Thus the tumour appears to be a good specimen of genuine hydronephrosis, in which pelvis and calices expand into a large cavity, and produce, by pressure, atrophy of the original structures of the organ.

" The peritoneal coat was rough with shreds of the broken down, extensive, and intimate adhesions. Some of the neighbouring organs, or portions of them, were so intimately connected with the tumour that their separation was impossible, and portions had to be cut off in order to remove the cyst. Such connexions existed between the spleen, the head of pancreas, the great curvature of stomach, principally at the pyloric end, the duodenum, a part of the left lobe of liver, coils of small intestine, omentum and mesentery, and along the entire extent of the vertebral column, as low as the second lumbar vertebra, uninterrupted, to these bodies, and their left transverse processes, and to the right transverse processes of most of the dorsal vertebræ. No adhesion, however, existed between the tumour and the bladder, uterus and its appendages, or the rectum."

After the information obtained by the *post mortem* examination, I made further enquiry into the history of the case, especially as to the state of the urine, and I learned from Mr. Scott that while the patient was under his care in the Hospital for Women, in January, 1866, the urine contained pus and albumen, was alkaline, and of low specific gravity, about 1·005. He had " no doubt of the tumour being ovarian, but considered the case an unfavourable one for operation, believing the front of the tumour was crossed by a loop of intestine which would, in all probability, be firmly adherent throughout its course; from the certainty of considerable adhesion, in consequence of the repeated attacks of inflammation; and from the presence of pus and albumen in the urine, with a feeble circulation. The quantity of pus varied considerably during her stay in hospital; albumen was pretty constantly present." Dr. M'Donnell has ascertained that when twelve or fourteen years old she was struck by an iron shovel with great

violence on the abdomen, near the left ilium. " She was felled on the spot, and remained insensible for some (indefinite) time. She was ill afterwards, and attended at St. Bartholomew's and other hospitals for eighteen months as out patient. She told her husband that during all this time she ' suffered much from the urine,' but did not explain more precisely the nature of the suffering; for four or five years subsequent to the first period of eighteen months, and for a like period during the first years of married life, she suffered pain and distress, referred to this injury. Her pregnancies were always attended with distress—indeed during her whole married life, 26 years, she repeatedly suffered from deep-seated pain in the abdomen where the injury was inflicted."

It is evident from the cases just narrated that both solid and cystic tumours of the kidney may be mistaken for ovarian tumours. Solid renal tumours, whether cancerous or innocent, may resemble the malignant, pseudo-colloid, or cysto-sarcomatous tumours of the ovaries; while different varieties of ovarian cysts may be closely simulated by different forms of pyelitis and pyonephrosis, hydro-nephrosis, cystic degeneration, and the growth of hydatids in the kidney. Perhaps the diagnosis may he facilitated by attention to the following propositions:—

1. Although intestine is sometimes found in front of ovarian tumours, and sometimes behind movable renal tumours, these are very rare exceptions to the general rule that renal tumours press the intestines forward, and ovarian tumours press them backward. In other words, ovarian tumours are in front of the intestines, renal tumours are behind the intestines.

2. Large tumours of the right kidney usually have the ascending colon on the inner border of the tumour. Tumours of the left kidney are usually crossed from above downwards by the descending colon.

3. The discovery of intestine in front of a doubtful abdominal tumour, should lead to a careful examination of the urine. It is possible that one kidney may be diseased and the urine quite normal, because the healthy kidney alone secretes urine. But the rule is that either blood, pus, or albumen, or characteristic epithe-lium, are detected—or some history may be elicited of their being detected at some former period.

4. If any doubt be entertained whether a substance felt between an abdominal tumour and the integument be or be not intestine, percussion may not solve the doubt, because the intestine may be empty and compressed. But (*a*) an intestine when rolled under

the fingers contracts into a firm, cord-like, movable roll; (*b*), the patient may be conscious of the gurgling of flatus along it, or the gurgling may be heard on auscultation; (*c*), the intestine may be distended by insufflation, after passing a long elastic tube through the rectum.

5. Ovarian and renal cysts may both be subject to great alterations in size. When the kidney is the seat of disease the fluid usually escapes by the ureter and bladder. An ovarian cyst can only empty itself through the bladder after adhesion and a fistulous opening. It may discharge through the Fallopian tube and uterus, or into an intestine, or through the coats of the vagina. In either case the physical and chemical characters of the fluid discharged will be the chief guide in diagnosis.

6. If a correct history can be obtained, it may be expected that a renal tumour has first been detected between the false ribs and ilium, and that it has extended first towards the umbilicus, next into the hypochondrium, and lastly downwards towards the groin. An ovarian tumour has, in all probability, been first noticed in one inguinal or iliac region, and has extended upwards and inwards.

7. It is only a very small ovarian tumour, with a long pedicle, which could be mistaken for a floating or movable kidney. The latter may be recognized by its characteristic shape, though it is often so misplaced that the hilus is turned upwards. The kidney is usually felt between the umbilicus and the false ribs, and may be pushed upwards and downwards, or laterally, to a varying extent, or into the lumbar region to the normal position of the kidney. When the kidney is pushed away from this position the sound, on percussion, becomes tympanitic.

8. Just as renal tumours are usually associated with some evidence or history of hematuria, calculus, albuminuria, nephritic colic, or some notable change in the quantity or state of the urine, so ovarian tumours are usually associated with some change in the quantity and regularity of the discharge, or with suffering at the catamenial periods, and with some alteration in the mobility or situation of the uterus. But as in some rare cases of renal disease the urine may be normal, so in some rare cases of ovarian disease there may be nothing abnormal to be discovered in any of the pelvic viscera, or in their functions.

By bearing these facts in mind an accurate diagnosis may be made in a very large proportion of cases. Some rare cases of exceptional difficulty may, however, be occasionally expected.

Not as an excuse to the careless and ignorant, but as some solace to others who have erred unwittingly, and as an answer to some who, having little experience of the difficulties of actual practice, are apt to speak of all mistakes as inexcusable, I quote the following remark of one of the greatest clinical teachers of any age or country—Bright:—" I have known the enlarged kidney to be mistaken for disease of the spleen—of the ovary—of the uterus— and for a tumour developed in the concave part of the liver; *nor is it, perhaps, possible, by the greatest care and the most precise know-ledge*, altogether to avoid such errors."—*Op. cit.*, p. 198.
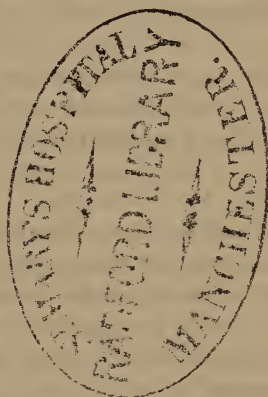
REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Rapport au Conseil de Santé des Armés. Sur les Resultats des Service Medico-Chirurgical aux Ambulances de Crimée et aux Hôpitaux Militaires Français en Turquie pendant la Campagne d'Orient, en 1854, 1855, 1856. Par J. C. CHENU, Docteur au Médecine; Médecin Principal. Folio, pp. 732. Paris: Victor Masson et Fils. 1865.

FULLY ten years have elapsed since the fall of Sebastopol, the crowning act of one of the most memorable campaigns of modern times—more splendid for the vanquished than the victors; and the history of the great events of the years '54, '55, '56 is yet to be written.

As a valuable contribution to the medical and surgical history of the war in the East the Report of M. Chenu will prove acceptable to all, more especially to those who took part, in person, in the events which he describes in such fulness of detail.

M. Chenu insists, at the outset, on the great importance of duly estimating the effects of disease on armies in the field; an important truth, which cannot be too often impressed on statesmen and commanders, who, willing enough to bring all a nation's resources to bear on the material of destruction requisite for campaigns of any magnitude, too often exhibit a spirit of parsimony in providing for the hygienic and medical wants of the troops engaged. Medicine has at all times striven to do her part; but until a post of higher authority is assigned at the council of war to the surgeon or physician-general of the army, we must still expect to hear of unnecessary sacrifice of life by fever or plague, and be content to believe that "the exigencies of military service" demand in each campaign a holocaust of perhaps the best lives which the nation prodigally furnishes from her most promising youth.

"War," says M. Chenu, "as military medical officers have not ceased to proclaim, and has been again recently well said by Dr.

Marrion, Physician-in-Chief to the Navy—war inspires generally in the world only the idea of combats, of strife more or less deadly. The soldier seems made only to be either killed or wounded. We forget too easily that the proportion of those who succumb to diseases, *due, in great part, to immaturity of constitution,* is infinitely superior to the number of those who are struck down by the fire of the enemy. We do not think sufficiently on those destructive scourges which fasten upon the flanks of an army perfectly provisioned with all the munitions of war, but always taken unprepared by those avalanche-like epidemics, which it would not be at all impossible to foresee, and the gravity of which might be moderated by measures which we shall indicate presently in speaking of recruiting and of the uniform *regimen* of an army in the field."

Perhaps in no campaign on record do the statistics now available so entirely and finally prove the truth of the positions here laid down. In the pages of M. Chenu we find summed up, not alone the total forces engaged on all sides, with the losses in killed, wounded, and dead of disease, but a considerable statistical return of the absolute number of projectiles of all kinds employed in both the Russian and the allied camps.

Some idea may be formed of the magnitude of the medical requirements of the French army from, or on consideration of, the following statistical returns. The highest number the French army ever attained at any period of the war in the Crimea appears to have been 150,000 men. The return for January, 1856, shows a total of 144,000. To maintain the army in an efficient state a total of 309,268 men were, at various periods, sent to the field of action from France and Algiers.

The following table shows the total losses in the various armies engaged, as summed up by M. Chenu:—

		Killed	Died of wounds or disease	Total
French army,	. 1854–1856,	10,240	85,375	95,615
English army,	. 1854–1856,	2,755	19,427	22,182
Piedmontese army,	1855–1856,	12	2,182	2,194
Turkish army,	. 1853–1856,	10,000?	25,000?	35,000?
Russian army,	˙. 1853–1856,	30,000?	600,000?	630,000?
		53,007	731,984	784,991

The numbers of the Turkish and Russian armies are given only approximately. The details for the French, English, and Piedmontese armies are as follows ˙—

French Army, 1*st April,* 1854, *to* 6*th July,* 1856, *and subsequent Deaths, to December,* 31, 1857.

Total of troops sent out, 309,268.

	Entries into Hospitals or Ambulances	Killed, Died, or Disabled
Different diseases and cholera, from 1st April, 1854, to 20th September, 1854, ... }	18,073	8,084
Ambulances in Crimea and hospitals at a distance from Constantinople, ... }	221,225	29,095
Hospitals at Constantinople, ...	162,029	27,281
Killed by the enemy or disabled, ...	—	10,240
Died, not in hospital or ambulance, ...	—	4,342
Loss of the *Sémillante* { Troops, ...	—	394
{ Sailors, ...	—	308
Infirmaries and hospitals of the fleet, ...	34,817	846
Died in France after the evacuation of the hospitals of the East, up to Dec. 31, 1857, }	—	15,025
	436,144	95,615

Taking into account that in many instances the same sick and wounded must appear in the returns of consecutive hospitals, and the cases of the same individuals returning to the same hospitals once, twice, or oftener for wounds or diseases, M. Chenu estimates the actual total of wounded and sick at 225,000.

English Army, 1*st April,* 1854, *to July,* 1856.

Total of troops sent out, 97,864.

Wounded, ...	18,283,	—	of whom 597 officers.
Died in hospitals from wounds,	—	1,847,	of whom 86 officers.
Killed on the field of battle, ...	—	2,755,	of whom 157 officers.
Admitted to hospitals—fevers, cholera, dysentery, &c., ... }	144,410,	—	
Deaths in hospitals, ...	—	16,298.	
Evacuated from hospital, and Died at sea, ... }	—	1,282.	
	162,693,	22,182.	

Amongst the deaths in hospital are to be noted 4,513 from cholera, and 463 from frost-bites. No account have yet been forwarded of those who must have died of the effects of wounds after the return of the army to England.

In the army of Piedmont, with a total of 21,000 men sent out, we find the return as follows:—

Killed by the enemy,	...	...	...	12
Died from wounds,	...	...	...	16
Died from disease,	...	...	...	2,166
				2,194

Let us now turn to the consideration of the means of destruction employed on all sides—and in no previous campaign have such ample materials been made available—to enlighten us as to the statistics of the agents of destruction, and the result thus produced as compared with those due to the invasion of disease.

The following table indicates approximately the number of projectiles employed in the Crimea by the various forces engaged, with the results in killed and wounded:—

		Projectiles employed	Killed or wounded
French army,	...	29,463,363	50,836
English army (?),	...	15,000,000	21,038
Piedmontese army,	...	50,000	183
Turkish army,	...	50,000	1,000
Allied fleets,	...	35,000	2,000
Russian army,	...	45,000,000	100,000
		89,595,363	175,057

This gives a proportion of about one killed or wounded for every 500 projectiles (accurately, within a fraction of one to 512). We cannot very well see how to accommodate the figures with M. Chenu's statement that, deducting deaths by explosion of mines, powder magazines, and various other causes, the proportion is one killed or wounded to every 1,000 projectiles.

The excess of small-arm fire over that of guns of large calibre throwing round-shot, grape, &c., appears to be infinitely greater than what we presume would accord with popular estimate. It is estimated, in the returns of which M. Chenu has availed himself, thus during the campaign:—

The Russians fired 2,800,000 large projectiles, solid or hollow.
42,200,000 balls.

The French returns show that there were employed—

532,565	canon balls,	
226,386	obuses, box shot, &c.,	
340,695	bomb-shells,	1,104,446
4,800	grenades, or fusees,	
12,362,648	spherical bullets,	
12,923,768	oblong bullets,	
2,379,116	Nessler bullets,	28,355,916
690,384	balles evidées,	

29,460,363

M. Chenu does not furnish any statistics to show what comparative amount of destruction was due to large and small projectiles respectively. Our own experience goes to show that, while shell and round shot produced, in numerous instances, very destructive effects, accompanied not alone with great loss of life, but much dismemberment and disfigurement of body, by far the largest proportion of deaths and wounds were due to the bullet.

Of the great skill of the Russian troops in the use of small-arms abundant evidence is on record. Not less can be doubted their energy and activity in immediately availing themselves of every improvement effected in the construction of instruments of offence and defence, and projectiles of all kinds. The following incident communicated to ourselves at the time, by a very distinguished medical officer at the head-quarters of the French army, may be cited as an apt illustration of what is here stated:—

The form of bullet known as the balle Nessler, and employed largely, as shown by the above tables, was the invention of an officer serving with the French troops in the Crimea. It was a bullet of short axis, consisting of a hemi-spherical head, very short cylindrical body, and deeply cupped base. The model of this projectile was, as we are informed, invented in the Crimea by M. Nessler, and sent to Paris to be manufactured in quantity for use in the field. Before the French supply arrived a ball of this identical construction was fired, and with effect, from the Russian side; and the writer has himself removed a balle Nessler (now in his possession) from a deep-seated wound of the neck. The conclusion is obvious, but the explanation not easy.

While the killed and wounded are seen to be as 1 to 500 for the projectiles employed, the killed and deaths from wounds show as 1 to 3·76 to the deaths from disease.

Inspection of the following table, compiled from M. Chenu's returns, show the total of troops, the total of wounded, of killed, &c. :—

Deaths from Wounds, with the Total of Deaths from Disease, for the Allied Armies.

—	Total Men	Killed	Wounded	Deaths from Wounds	Entries to Hospital	Deaths from Disease
French army, .	309,268	10,240	40,320	10,000	436,144	74,000
English ,, .	97,864	2,755	18,283	1,847	162,693	17,580
Sardinian ,, .	21,000	12	—	16	6,620	2,166
		24,870 Deaths by Projectiles.			605,457	97,746

The results of these columns may be thus summed up:—

Proportion per Cent. of Deaths, to Total Forces Employed, by Projectiles and Disease.

	Per-centage of Deaths from Projectiles		Per-centage of Deaths from Disease
French army,	- - 6·54	...	23·93
English army,	- - 4·70	...	17·96
Sardinian army,	- - 0·13	...	10·31

We have seen that the proportion of deaths and wounds to projectiles was 1 to 500; but of the wounded many recovered. The exact proportion of deaths, including those dead of wounds, amongst the allied troops to the Russian projectiles employed is as 1 to 1,809—24,870 deaths by projectiles to 45,000,000 Russian projectiles.

Now, we find returned an aggregate of 93,746 deaths from disease, with a total of 605,457 admissions to hospital. Omitting 11,863 who died of wounds in hospital, and excluding then those who recovered of wounds in hospital (numbering   ), the admissions for disease may be taken at 593,594; the deaths from disease show a proportion to the number of admissions of 1 to 6·33.

To the siege of Sebastopol the allied hosts sent a total of 428,132 men; of these 118,616—more than one-fourth part—totally perished by disease and the engines of destruction of the enemy. Of those thus destroyed but 24,870 were slaughtered by the Russians, while 93,746 were annihilated by disease.

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If we suppose the Destroying Angel hurling his death-shafts from the summit of the Malakoff Tower on the invading hosts, we might well conceive that even his immortal arm was wearied when he found that to bring death to one individual in the allied armies he had to hurl against him not less than 1,800 of the most deadly projectiles which the art and science of the most advanced and civilized nations of modern Europe placed at his command. Gladly could we fancy him turning to his older, surer, and more lethal weapons, fever, flux, scurvy, or aught else of his armoury of disease, which, for each six shafts sent forth, laid low his man; the sum of his work being that, for 45,000,000 projectiles expended, he produced a diminution of but one-sixteenth of the forces they were employed against, while, with somewhat over 600,000 attacks of disease, he cut off little short of one-fourth of the invading army, and disabled, for a period, every man in the field against him once and a-half times.

An interesting and not unimportant point of view in which M. Chenu discusses the bearing of the sickness of the army is in regard to the question of expense; and here, too, we have the elements for comparison as to cost incurred for the cure of the wounded and those from disease. Dead men tell no tales, it is said; and in the statistics of war they bear but little cost. The first loss is all that is felt when the bullet, the shell, or the bayonet has done its work effectively; the most serious item to every commander is "the butcher's bill" for the care, cure, or provision of the wounded until death or recovery, and often for life in the latter case.

Comparing the number of days required for the treatment of wounded and sick, we find, for the French army:—

	Wounded	Sick, not Wounded	Total
Days of treatment,	1,934,313	5,337,888	7,272,201

Estimating the cost of treatment at 2 francs 50 centimes per day, M. Chenu calculates the cost of treatment:—

For wounded, ...	4,835,772:50	= £193,431	6	3
For sick, not wounded, .	13,344,720: 0	= £533,788	16	8

A fearful loss is here involved; not altogether avoidable, it is true, yet far exceeding the limits to which, as we maintain, it should extend if all due precautions for the care and maintenance of the troops were exercised.

If we estimate the prime cost in money of each soldier sent on that campaign, when actually in the field equipped for service, at £200—a low calculation, be it observed, when made to include cost of transport, &c.—we shall find that the deaths on the field and from wounds represent a money value of about £4,974,000 sterling, while the deaths from disease represent a loss equivalent to about £18,749,200.

In accounting for the large mortality of the allied forces, M. Chenu dwells forcibly on the defects of the system of recruiting—the immature age, strength, and development of the young soldier—the imperfection of his organization, and his inability to withstand, for any lengthened period, the fatigues, hardship, and duties of campaigning. Of a force of 100,000 men, as recruited for the Crimean campaign, he believes that at least one-tenth will be found ineffective. The total French force present at the Alma was but 30,000 men, more than 18,000 having been admitted to hospital before seeing the enemy or having had to make a forced march. From the English statistics he cites the already published statement that of upwards of 94,000 sent to the seat of war, more than 15,000 are reported as unfit for military life when recruited, owing to various defects of constitution. In the report to the Minister-at-War, subsequently published by Parliament, Dr. Lyons, the Pathologist-in-Chief to the British Army in the East, points attention, in the strongest manner, to the incompleteness of physical development, and consequent inherent unfitness for service, of a very large portion of the recruits sent out during the war. The following passages may be cited here with advantage:—

" In treating of the various predisposing causes of Disease in operation amongst Her Majesty's Forces in the East, there is one which may be classed amongst Physiological influences, and which demands most earnest consideration at your Lordship's hands. I allude to the extreme youth, incomplete physical development, and general immaturity of a very considerable proportion of the strength of several regiments, and constituting, as I have reason to believe, in the total of the Army, a number sufficiently great to render the question one of vital moment and of even national interest, as largely affecting what may be called the Physiological Economy of the Army. Amongst even well-matured constitutions, the hardships and fatigues, trials, privations, and exposure of campaigns, such as those of the past years in the Crimea, must almost of necessity prove largely productive of disease, and induce much mortality. But on the undeveloped frames and the unripe strength of the ill-seasoned

recruit such causes operated with twofold energy, and with a more than doubly fatal effect.

"Not only does the power of resistance to morbid influences, and the consequent invasion of Disease in such youths seem inferior to that of the older soldier, but when attacked they succumb more readily under the effects of a Fever or a Flux. And even when such disease does not prove immediately fatal, the convalescence of the young is generally slow, constantly attended by a disposition to relapse, or to the development of those Secondary Enteric Lesions the almost unfailing result of such Fevers as those which prevailed amongst the Troops in the East. Again, should constitutional taints exist, as is not uncommonly the case, more especially in regard to the Strumous diathesis so general in some of the classes from which recruits are largely raised, the fatigues and privations of Active Warfare, the exposure and vicissitudes of the field, and the attacks of Acute Disease, supply precisely the stimulus most calculated to call into active operation various low and complex forms of Disease with a slow and lingering course. Such diseased processes either prove directly fatal of themselves, or so complicate other morbid states set up in the system, as to leave no expectation of aught but a fatal issue.

"Such doubtless is the rationale of the Pathology of many of the examples of Tubercular development in Typhoid and Dysenteric cases, which we have witnessed in the Secondary Hospitals of the Bosphorus, in some instances causing death by Lesions peculiar to itself; in others inducing most complex processes of disorganization in the vital parts.

"Even when the less formidable of such cases are not actually fatal, convalescence is usually so slow, lingering, and imperfect; that as soldiers, these youths cannot be, till the expiration of a long period, if ever, sound and effective men; while during such time of convalescence they but burden the Hospitals, required as they often are, for the more pressing wants of the field. Thus not only does their illness cause the loss of their own services, but it encumbers the Hospital Staff, while their transport is an additional pressure on departments already perhaps, fully worked.

"The results of Surgical Pathology corroborate to a large extent the observations just made, which are chiefly based on considerations arising out of the behaviour of the immature constitution under the effects of Disease. As a general rule, true at least in a very large part of its usual acceptance, youth forms a favourable element in the calculation of chances in surgical cases. Amongst the troops in the Crimea, however, no such favourable anticipations could be indulged on the score of youth. The constitution of the young, even independently of the presence of actual disease, seemed much impressed by the influence ef the various causes already dwelt on; many succumbed almost immediately under the shock of injuries, and in the case of the graver Surgical Operations, no more advantageous results, but the contrary, appeared to be shown on the side

of the young : in fact, youth was not to be counted on as a favourable element in determining a prognosis in such cases.

" In the statements I venture to make respecting the operation of youth and immature physical development as a predisposing cause in the production of Disease, I do not rely solely on the results of my own observations. This subject has been the topic of repeated consideration with some of the most experienced and accomplished medical officers in the field, by whom my views on these physiological points have been fully concurred in. And, indeed, I do not believe that any persons sufficiently acquainted with the principles of Physiology could entertain opinions in the least differing from those here expressed.

" I am not in a position to prove, by actual statistical evidence, the precise proportion to strength in the entire Force in the Crimea, at any given date, of those who may be considered as of immature age. I did not possess the means of determining such questions on any large scale ; and I do not pretend to any such results. However, amongst a portion of the wounded of the 18th June and 8th September, I found means to make a few statistical observations. The cases may, I think, be fairly taken as a general average, and so far admit of being used to support what is stated above. The joint numbers on the occasions of the assaults on the Grand Redan, received into one hospital in the field, amounted to 664, embracing all variety of gun-shot injuries, and some of the very worst kind. Of this number of men the average age was $24\frac{1}{2}$. But this statement would give only an inadequate view of the actual youth of a great proportion of them. Sixty-one were *under* the age of 20, of whom one was only 17, and the rest varied between 18 and 19 ; 75 were *of* the actual age of 20 years. Thus of the whole, considerably more than one-fourth were actually only 20 years of age and under ; 76 were found to be between 30 and 40, inclusive ; two were of the actual age of 40 ; while one was stated to be 48, which is at least doubtful. The remainder, constituting a little more than two-thirds, were of various ages between 20 and 30, the majority inclining to the former rather than the latter These results show a very high proportion of immature youth, such as, I have no hesitation in saying, it is not consistent with any sound physiological principles to expose to the severe trials and hardships of actual War. Amongst them disease finds a rich and easy harvest.

" I would not wish to be understood as implying that any objections exist to the practice of early enlistment. On the contrary, such a measure is undoubtedly of great general utility. On home service, or on secondary foreign stations in favourable climates, the training and well-regulated exercise of the young soldier conduce to the development of a vigorous frame, and in no small degree add, I am persuaded, to the natural powers of the constitution. Such training should, however, be gradual and apportioned to the strength of the recruit, according to the earliness of

the period at which he is enlisted; and under a properly regulated system I believe it would not be necessary to fix any precise limits in this direction. Trained at home, and gradually inured to the fatigues of the soldier's life, by a suitable rotation in the selection of foreign stations, Troops could, I doubt not, be slowly but steadily brought to a maximum of safe endurance of the hardships of Warfare, far above the average of what is now reached. A judicious system of 'cross drafting,' or some such expedient, would enable the younger soldiers and recruits of one regiment ordered to the seat of War to be replaced by the more hardy, seasoned, and serviceable men of another; while in the several secondary depôts on the high road to the scene of action, the former could undergo a gradual process of seasoning and acclimatization, which would ultimately add immensely to their actual strategic value and efficiency when called to the field in their turn. In this way I believe no loss of strength or actual inconvenience to the Service could result; while the increased efficiency of a large proportion, probably one-fourth of the Forces, in the field would be thus almost certainly secured. I am sufficiently well aware that the employment on active service of the young and immature prevails largely in other Forces besides the English; but I have reason to know that it is with equally unfavourable results. Neither precedent nor practice, however, can be admitted as outweighing the dictates of Physiology, and the results of Pathological experience in a matter of such moment. As a conviction based on these consideration, I would beg respectfully to express it as my unqualified opinion that no soldier under 21 years of age should be sent on service to the Crimea, or any other seat of actual War: and not even then, without a previous training and gradual acclimatization in suitably chosen secondary stations. In the foregoing statements I believe I am justified in saying, that I express views shared in by a large number of the most able and intelligent Medical Officers.

Besides the class of men who, by reason of youth and immaturity of physical development, seemed to suffer peculiarly from the toils of Crimean life, it will be necessary to briefly notice another class equally unfitted to make effective Troops, but from a somewhat different cause. I allude to those recruited at a rather advanced age, 25–30, from the mechanical trades in densely populated towns. Such men have seldom enjoyed a vigorous youth; and even at this age (30) the meridian of their physical development is passed. Ill fortune, or it may be a life of dissipation, has led them to take to arms as a last resource. How far any of such men are capable of becoming efficient soldiers I know not; but it is certain that the testimony of Medical Officers bears me out in the observation that they are constant and early applicants for admission into hospital, their constitution, never robust, soon giving way under exposure and fatigue. Men of such a class may add to the numerical, but never

to the effective strength of an Army, and it is more than doubtful if they ever repay the labour and cost of their transport, and of their maintenance in the Field or Secondary Hospitals. One sound, seasoned, and effective soldier outweighs in value any number of immature and inefficient youths or effete adults. And in the Physiological Economics of an Army, the maintenance of the largest number of effective men is the great problem.

"The several agencies just considered, many of them continuously in operation, and others, though ceasing to be immediately felt, leaving well-defined impressions behind them, had induced sensible modifications, as I have already said, in the constitution of the soldier. Some of these effects were visible to the eye. A marked characteristic of the Crimean soldier was a premature appearance of age. The veteran of 40 would be readily taken, by the inexperienced, for the old man of 60 to 65; the youth of 20 to 22 wore the settled aspect of 35 to 40. With the haggard features of disease, especially that of a chronic kind, these appearances became still more exaggerated, often to a most marked degree.

"Even with those who possessed a still robust exterior, and all the apparent physical conditions of health, the manner in which their system was observed to behave under the influences of disease or the effects of injury or operations, showed that the force of the constitution was to a very considerable extent deteriorated. To express this in another way, it may be stated that the available *vis vitæ* for the resistance to, or recovery from Disease, or for the resistance to, or recovery from the effects of Injury or of great Surgical operations, was below the average physiological standard. The powers of the system, and consequently the *viability*, so to speak, of the soldier were below par. This was especially manifested in some of the prominent and distinctive characters of prevailing diseases, which presented a decidedly low adynamic, and often Typhous type, and such as urgently called for a generous and stimulant treatment."

The valuable observations of Professor Aitken,[a] Drs. Liharzik, Boyd, Dawson, &c., may be studied with advantage, as bearing on the question of mature growth and fitness for laborious occupation. The human adult, it will be found, does not come to his fully matured growth until he attains the age of twenty-five years. In the forcible language of Lord Raglan to the Duke of Newcastle, during the height of the Crimean campaign:—"Those last sent out were so *young* and *unformed* that they fell victims to disease, and were swept away like flies." That too great a standard of height was aimed at in the English service there can be now little doubt,

[a] See Professor Aitken's Growth of the Recruit. 1862.

that for growing lads of eighteen having been above that of the average human being, as shown by the researches of Quetelet, Liharzik, &c. We question if even yet too high a standard is not exacted in the British army. Well-knit *little* men will be found to stand the wear and tear of the soldier's life better than those more showy in appearance because of greater height.

An interesting portion of M. Chenu's report presents us with a journal of the daily states, numbers, positions, operations, casualties, and diseases of the French army throughout the entire campaign; appended to which we find, in reference to all the great operations jointly undertaken, a summary of the similar records furnished for the British army; and when the Sardinian army became engaged like data are cited for that force.

At a very early date aberrations of health began to be noticed in the French troops. Works connected with the projected defence of Galipoli commenced 10th April, 1854, and necessitating trenching and turning of earth, and employing about 3,000 men, appear to have been the principal cause, in conjunction with cold night air, in producing fevers and ophthalmia. An extra ration of brandy was now issued. Scurvy began to make its appearance in the fleet April 23, 1854; cholera made itself felt in the succeeding month; paludal influences likewise began to exhibit their effects, especially amongst the sailors of the fleet, in the induction of intermittent and remittent fevers. M. Chenu, we may here observe, with regret, supports the view that cholera was brought from France to Galipoli, and thence by certain convalescents to Varna. He goes so far as to name the individual ships by which the chain of contagious communication was, as he conceives, established between the ports of Bulgaria and those of the south of France. Cholera undoubtedly prevailed at Marseilles at the period in question.

Towards the close of July took place the expedition into the Dobrudscha, so unfortunately signalized by a destructive invasion of cholera which speedily necessitated the abandonment of an advance in that direction. The effective mean of the French troops for this month (July, 1854) represents 55,000 men—8,239 cases of cholera are reported, of which 5,030 died; the month of August furnished a less number of cholera cases, but proportionately a far higher mortality, viz., 3,043 cases, with 3,015 deaths. Thus, before the landing in the Crimea, a total of 18,073 French soldiers had passed into the various hospitals of Galipoli, Adrianople, Varna, and the ambulances, with a mortality of 8,045, caused by cholera alone.

History will take but little notice of this terrible scourge of the French army, although she will never weary to tell of the events which occurred twenty days later—the battle of the Alma, 20th September, 1854—when the killed in all armies engaged—141 on the French side, 348 on the English, and 1,807 on the Russian side, in all 2,296—bears but a small proportion to the total of deaths garnered up by disease amongst the French alone in two short months, viz., 8,045! and the total of killed and wounded in all the armies engaged on that memorable day, 8,036 (of the latter, be it observed, a large part recovered), does not quite reach the sum of the losses of the French army, before its landing at Oldfort, from one malady alone—cholera.

It will be at once convenient and not devoid of interest to insert here brief summary statements of the details of the casualties experienced by the armies engaged in the principal operations of the war. They will serve as points of comparison for the data we shall afterwards supply when studying in one view the numerical proportions of the diseases which ravaged the contending armies:—

Battle of the Alma, September 20, 1854.—*Detail of Allied and Russian Forces.*

	FRENCH			ENGLISH		TURKS		RUSSIANS	
—	Officers	Troops	Ordnance	Officers and Troops	Ordnance	Officers and Troops	Ordnance	Officers and Troops	Ordnance
Staff . .	35	100	—	—	—	—	—	—	—
Infantry .	853	24,250	—	18,000	—	—	—	50,000	—
Cavalry .	7	203	—	1,200	—	—	—	6,000	—
Artillery .	103	2,676	68	1,000	50	7,000	12	3,000	140
Engineers .	43	866	—	480	—	—	—	—	—
Med. Service .	41	—	—	} 800	—	—	—	1,000	—
Military Train	105	1,046	—		—	—	—		—
Totals .	1,187	29,141	68	21,480	50	7,000	12	60,000	140

TOTAL OF ALLIES.

		Artillery			Artillery.
French, .	30,328	...	68	Russians, 60,000	... 140 pieces.
English, .	21,480	...	50		
Turks, .	7,000	...	12		
	58,000		130 pieces.		

It is to be observed, that the foregoing numbers, given by M. Chenu for the British forces on the day of the battle of the Alma, do not correspond precisely with the official records. There appear to be no documents in the Adjutant-General's offices which will give with absolute certainty the numbers of the troops engaged; but a letter to the late Duke of Newcastle showed the strength of the various arms of the service to have been as follows:—

> 1,100 Cavalry.
> 3,100 Artillery and Engineers.
> 22,600 Infantry.

> Total, 26,800—(*Information from Horse Guards, Oct. 24th, 1866.*)

Battle of the Alma, September 20, 1854.—Killed, Wounded, or Prisoners.

—	FRENCH ARMY			ENGLISH ARMY			RUSSIAN ARMY		
	Killed	Wounded	Disappeared	Killed	Wounded	Disappeared	Killed	Wounded	Disappeared
General Officers . . .	—	2	—	—	1	—	—	5	1
Officers	3	59	1	26	92	—	45	96	—
Non-commis. Officers and soldiers	138	1,136	2	322	1,539	—	1,762	2,720	1,007
Totals	1,341			1,970			5,636		

Losses of 17th Oct., 1854.—Bombardment by Allied Fleets, and Land Attack.

FRENCH ARMY AND FLEET		ENGLISH ARMY AND FLEET	
Killed	Wounded	Killed	Wounded
61	401	304	266
TURKISH ARMY AND FLEET		RUSSIAN ARMY	
Killed	Wounded	Killed and Wounded	
?	?	500	

The strength of the English land forces on the 31st October was 35,445.—(*Horse Guards information.*)

Battle of Balaklava.

		Killed	Wounded
French troops engaged, .	...		
English troops engaged, .	...		

(Cavalry, 400 killed and wounded out of 600.)

Turkish troops engaged, ...
Russian troops engaged, .   2,500, with 40 pieces of cannon; killed and wounded, 500.

The following is the state of the British army in the Crimea on the 24th October, 1854, the day before the action at Balaklava.— (*Horse Guards information.*)

	Cavalry	Artillery & Engineers	Infantry
Under arms, ...	1,916	3,125	18,639
Detached on command, batmen, or otherwise employed,	421	217	3,816
Sick, Present, ...	234	48	1,001
Absent, ...	307	130	5,526
	2,878	3,520	28,982

Total officers and men, 24th Oct., 1854, 35,380

Battle of Inkermann, November 5, 1854.

French troops, . 41,019
English troops, . 14,000
Turkish troops, .

In the month of July, 1855, the hospital requirements of the French army in the East reached the following astounding figures. Twenty-three secondary hospital establishments, radiating in and around Constantinople, afforded accommodation for   19,182 beds, while in the Crimea, at the end of July, there remained   6,816 cases, while the fleet comprised   2,803 sick;

Total, 28,801

After the 8th September the hospital requirements in the Crimea alone rose to over 20,000 beds for sick and wounded inclusive. The situation of the army on the 15th of August, the eve of the battle of the Tchernaya, showed, of a total force of 119,113, the large number of 27,588 ineffective from various causes, and so gave a burden and embarrassment to the army as well as a loss.

Battle of the Tchernaya.

French army engaged, 30,000.   Russian army engaged, 70,00.

Killed	Wounded	Missing	Killed	Wounded	Wounded carried off	Prisoners
291	1,227	46	3,320	1,814	6,000	498

On the 3rd September the advanced works of the French army were within 25 to 30 metres of the Malakoff, 40 metres of the Little Redan, 50 metres of the Flagstaff Battery ; the advanced works of

the English army were within 200 metres of the Grand Redan. The daily losses are considerable. The French have about 150 men killed and wounded every twenty-four hours; the English, in proportion; the Russians, obliged to retain within their walls a force sufficient to resist an assault, suffer, from the converging fire, losses which are estimated at 1,500 to 2,000 per day.

On the 5th September the fire of all the batteries is opened along the whole line; the French count 635 pieces of ordance, the English 179, the Russians about double. The sublime grandeur of the effect thus produced who can forget that was there to share!

The French losses during the bombardment, 1st to 8th Sept., are thus reported:—

Killed	Wounded	Missed
204	1,325	4

The Russian losses are thus given:—

	Killed and Wounded
17th August, ...	1,500
17th to 21st August, . . .	5,800
22nd August to 5th September, .	8,550
5th September to 8th, . . .	3,968

The effective troops on the memorable 8th September are thus enumerated:—

French, . . .	126,705
English, total forces, .	55,810
Sardinians, . . .	
Total, . .	190,420

Losses.

FRENCH			ENGLISH		
Killed	Wounded	Missing	Killed	Wounded	Missing
1,634	4,783	1,416	385	1,910	176

SARDINIANS			RUSSIANS		
Killed	Wounded	Missing	Killed	Wounded	Prisoners
4	36	—	2,684	7,290	1,763

Total killed, . .	4,707
,, wounded, .	13,749

On the 15th November took place the terrific explosion of the powder magazine, and ammunition of all kinds stored in the park of artillery near the Mill of Inkermann These magazines contained 50,000 kilogrammes of powder, 600,000 cartridges, 4,000 large projectiles and fusees, the fragments of which were carried to a

distance of more than 1,200 metres. No sight of more terrific grandeur can be well conceived than that offered by this explosion. After the first explosive movement upwards a column of smoke, heterogeneous *debris* and projectiles of most colossal proportions, apparently some 200 feet in diameter, continued to rise with a steady and majestic motion until it seemed to bear up the heavens upon its summit.   High in mid-air shot, shell, and projectiles of all kinds were thrown off from the centre, starring the mass with the fire of live shells successively exploding, and seaming the sky in gigantic spray-like arches with the shooting fires of thousands of rockets, fusees, &c.

The losses by this explosion were:—Killed, 20; wounded, 114; missing, 18; besides many animals, as horses, cattle, &c., killed and fearfully maimed.

The following table (page 162) will show, for each month of the years over which the eastern campaign was spread, the casualties by arms of war and by disease for the French army.

The strength of the British forces at Inkerman, as here given by M. Chenu, is certainly incorrect, and greatly over-estimates the actual numbers of troops engaged on that day so memorable in the annals of the British army.   It was stated in Lord Raglan's despatch that the numbers actually engaged at the battle of Inkerman scarcely exceeded 8,000 men.   The following is the return of the strength of the army on the 4th Nov., 1854:—

	Cavalry	Artillery, Sappers and Miners	Infantry
Under arms, ...	1,417	3,154	17,436
Detached on command, batmen, or otherwise employed,	449	260	4,355
Sick, { Present, ...	149	50	1,131
{ Absent, ...	512	130	5,104
	2,527	3,594	28,024
Officers, ...	107	147	708

Total officers and men, Nov. 4th, 1854,   35,107

The brigade of Highlanders, upwards of 2,000 men, was at Balaklava; the 3rd division, of 3,400 men, occupied the heights in rere of the trenches, a sortie from the town being expected; and about 3,600 were in the trenches; these deducted from 17,436,

the infantry under arms, leave 8,436, nearly agreeing with the number given in Lord Raglan's despatch.[a]

Russian Forces.

1. Attack on Inkermann, under Gen. Damemberg, 50,000, with numerous artillery.
2. Attack on Balaklava, under Gen. Liprandi, 20,000, with cavalry and artillery.
3. Sortie on the besiegers, under Gen. Timofieff, 5,000, with artillery.

Details of Losses at Inkermann.

	FRENCH			ENGLISH			RUSSIANS		
—	Killed	Wounded	Missing	Killed	Wounded	Missing	Killed	Wounded	Prisoners
General Officers . .	—	2	—	3	5	—	1	—	—
Officers	26	96	1	40	97	—	61	206	—
Non-commis. Officers and Soldiers	203	1,453	69	486	2,184	—	6,000	9,200	267
Totals, ...	1,850			2,815			15,468		

Losses by the French Troops.—Attack on Mamelon Vert, June 7, 1855.

Killed	Wounded	Missing
697	4,363	303

Losses 18th June, 1855.

FRENCH ARMY			ENGLISH ARMY			RUSSIAN ARMY	
Killed	Wounded	Missing	Killed	Wounded	Missing	Killed	Wounded
1,370	1,765	416				743	4,979

Strength of the British Army at various periods during the siege of Sebastopol:—

	Cavalry.	Artillery & Engineers.	Infantry.
Under arms, ...	1,274	2,780	18,612
Detached on command, batmen, or otherwise employed,	593	278	4,741
Sick, { Present, ...	266	29	2,110
Absent, ...	509	598	6,338
	2,642	3,685	31,801

Total officers and men, 27th Nov., 1864,   38,128

[a] Medals of the British Army, by Thomas Carter, Adjutant-General's Office.   Vol. i., p. 45.

Under arms, ...	1,197	3,132	17,882
Detached on command, batmen, or otherwise employed,	548	306	5,069
Sick, { Present, ...	193	564	4,821
{ Absent, ...	576	673	9,174
	2,514	4,675	36,946

Total officers and men, 11th Jan., 1855,   44,135

Under arms, ...	1,264	3,804	18,931
Detached on command, batmen, or otherwise employed,	409	243	3,869
Sick, { Present, ...	161	259	3,422
{ Absent, ...	322	673	9,746
	2,156	4,979	35,968

Total officers and men, 1st April, 1855,   43,103

Under arms, ...	2,822	5,057	25,651
Detached on command, batmen, or otherwise employed,	492	292	3,646
Sick, { Present, ...	277	654	2,751
{ Absent, ...	97	396	6,592
	3,688	6,399	38,640

Total officers and men, 18th June, 1855,   48,727

Under arms, ...	3,643	5,847	29,913
Detached on command, batmen, or otherwise employed.	757	306	3,896
Sick, { Present, ...	796	739	3,261
{ Absent, ...	370	559	5,723
	5,566	7,450	42,793

Total officers and men, 7th Sept., 1855,   55,810

Years	Events	Frostbite — Died	Frostbite — Entered	Typhus — Died	Typhus — Entered	Scurvy — Died	Scurvy — Entered	Cholera — Died	Cholera — Entered	Various Diseases — Died	Various Diseases — Entered	Remittent Fevers — Died	Remittent Fevers — Entered	Fevers — Died	Fevers — Entered	Missing or Prisoners	Wounded	Killed	Died	Entered
1854																				
April											334			4	430				4	430
May											75			17	1,941				17	2,278
June								8	8					10	1,625				18	1,708
July								5,015	8,239										5,030	8,239
August	Cholera							3,015	3,043						2,375				3,015	5,418
Sept.	Cholera; Battle of Alma							239	376					3	491	3	1,197	271	258	2,064
Oct.	Bombardment and siege							289	820					123	2,596	1	1,288	108	877	4,747
Nov.	Siege and Inkermann	4	371				47	149	426		44			286	2,981	88	1,915	308	659	5,947
Dec.	Siege, cold	8	522	15	86	2	148	114	374		53			543	4,628	11	535	88	771	6,432
1855																				
Jan.	Siege, fever, cold	15	2,141	18	161	6	452	107	462		34			789	5,343	31	639	87	997	9,259
Feb.	Siege, fever, cold	3	180	33	257	6	703	98	141		42			256	6,188	44	742	160	457	8,298
March				15	84	4	836	82	11		14			281	5,228	80	1,528	333	518	7,737
April				9	57	7	963	6	22		29			386	2,708	50	2,501	358	626	6,323
May				5	9	2	192	202	512			32	527	522	3,184	68	4,308	1,002	1,140	8,732
June	Assault on Mamelon and Malakoff			5	1	5	636	802	4,762		41	68	1,260	2,493	6,727	799	8,089	2,344	3,581	21,475
July	Siege			9	77	11	1,253	896	1,244			67	2,073	666	8,315		3,052	411	1,946	16,088
August	Tchernaya			14	18	9	2,581	658	1,033			60	2,358	673	6,045	68	4,484	904	1,796	16,519
Sept.	Malakoff			3	5	28	1,516	341	484			66	1,238	468	2,478	1,424	8,453	1,817	2,254	14,226
Oct.				4	10	33	726	294	533			30	853	681	5,263		628	37	1,411	8,018
Nov.				6	10	25	723	133	179			12	641	544	6,787	18	298	20	771	8,638
Dec.	Fever, cold	2	1,496	323	734	57	1,256	4	11			247	725	713	8,716	16	11	2	1,810	12,949
1856																				
Jan.	Fever		452	464	1,523	132	3,980					260	539	907	6,916				1,763	13,424
Feb.	Fever		110	1,435	3,402	156	4,341					482	840	873	4,764				2,946	13,457
March	Fever		18	1,830	3,457	132	1,787					250	681	628	2,091				2,839	8,034
April				101	237	31	785					197	253	1,082	3,506				1,411	4,781
May				17	38	4	275					20	207	342	2,798				383	3,318
June				2	5	1	50					4	29	92	874				99	953
July														2	18				2	18
Total		30?	5,290	4,308	10,166	647	23,250	12,407	22,630	..	666	1,795	12,265	13,563	105,021	2,708	39,868	8,250	29,095	201,535

50,636

Das Chloroform—Eine Zusammenstellung der bisher über dasselbe gemachten wichtigsten Erfahrungen und Beobachtungen vorzüglich in physiologischer und medizinischer Beziehung. Von DR. FRIEDRICH SABARTH. Würzburg: 1866. Pp. 276.

Chloroform—A Collection of the Most Important Experiments and Observations which have hitherto been Made on this Substance, chiefly in a Physiological and Medical Point of View. By DR. SABARTH.

THE plan of the work before us is sufficiently explained in its title. The object of the author is not so much to record his own observations and conclusions, as to collect from various scattered sources and to arrange systematically all that has been written by others on the medicinal uses of chloroform. This design he has accomplished with the laborious and painstaking industry which is so characteristic of German writers.

The earlier sections are devoted to the chemistry of chloroform, its production, chemical and physical properties, signs of purity, &c.; after which is an account of the different modes which have been employed from the earliest times to the present for the production of anesthesia. We then come to a long chapter containing an account of the experiments which have been made on animals in order to ascertain the physiological action of chloroform inhalation, and to determine how it causes death. The results arrived at by different experimenters are somewhat discrepant. We choose for quotation those of the French Commission appointed by the Society of Emulation, as being the fruit of numerous and carefully made observations. 1. The rapidity with which chloroform acts varies with the concentration in which its vapour is inhaled; the phenomena which it produces develop themselves always in the same succession, and with the same characters. 2. Chloroform abolishes the excito-motor influence of the nervous centres and the sensibility and motility of the spinal nerves; the excitability of the spinal cord and the power of the nerves to excite motion under the stimulus of electricity still persist. 3. Chloroform has a special affinity for the nerve centres, in the substance of which it accumulates during inhalation; here it is found after death in greater quantity than in other parts. 4. In chloroformed animals the movements of respiration cease before those of the heart; the heart is the part of the

body which dies last.   5. The animals die if left to themselves after the cessation of respiration.   6. Chloroform is very quickly removed from the body; the lungs are the organs which are most active in this elimination; the skin helps but little.   7. Electricity exhausts quickly the irritability of the nerves in animals who have arrived at the last stage of chloroform poisoning.   8. Death, when it arises from chloroform inhalation, is the consequence of an annihilation (vernichtung) of the influence of the nervous system, and not the consequence of asphyxia or of paralysis of the heart. 9. The dilution of the vapour of chloroform with a large and constant proportion of atmospheric air can, if not quite remove the danger, at least greatly postpone and diminish it.

With these conclusions the results obtained by Weber for the most part agree; he, however, objects to the seventh and eighth conclusions of the Commission.   He can find no evidence to show that in a chloroformed animal the nerves are exhausted by electricity more quickly than in an animal not under the influence of the anesthetic, and he argues that though the apnea and the stoppage of the heart are caused by the abolition of nervous influence, yet that they are the immediate cause of death, as is shown by the recovery of the animal if the action of the heart be kept up by artificial respiration till the poison is eliminated.   No mention is made in this chapter of the recent experiments of the Chloroform Committee of the Medico-Chirurgical Society.   This is to be regretted, as they were better conducted and more conclusive than any of those which have been recorded by Dr. Sabarth.

In the next chapter we find details of 119 cases in which death is said to have been caused by chloroform inhalation.   After an accurate examination of these the author thinks that in 48 only can, with certainty or high probability, the fatal event be attributed to the anesthetic.   Of these 48 deaths 36 were caused by asphyxia, 11 by syncope, and 1 by spinal apoplexy.   Although asphyxia is thus shown to produce the greatest number of deaths, yet syncopal symptoms are more frequently met with; they are, however, more easily combatted than is asphyxia.

Dr. Sabarth finds, like Dr. Charles Kidd, that fatal effects are more frequently produced when chloroform is administered for small operations than when it is given for amputations or other operations of the first magnitude.   With regard to the stage of inhalation at which death most frequently takes place, he gives the following numbers, taken from the works of Snow, Scontetten, and Kidd.

Of 121 cases, death occurred in 54 during the administration of the chloroform and before the commencement of the operation; in 42 during the performance of the operation; and in 25 after the completion of the operation, either immediately or after an interval. Hence it appears that the early stage of inhalation, or that of excitement, is the most dangerous. Of 133 fatal cases recorded by the same authors, in which the sex is noted, 90 occurred in men, and 43 in women.

After death from chloroform the *post mortem* appearances are not at all characteristic. A dark and fluid condition of the blood, emptiness, pallor and flaccidity of the heart, and gas bubbles in the veins, are among the most important of those which have been recorded. On the whole subject of death from chloroform the author thus concludes:—"When compared to the innumerable multitude of those to whom chloroform has been administered and to whom it is yearly and daily administered, the small number of cases in which death can be with certainty or probability attributed to this agent holds but a very small proportion. We must further consider that of the hundreds of thousands who have been chloroformed certainly many more would have died of anxiety, disquietude, or fear before the operation—of pain or agitation during its performance, or of its consequences, if chloroform had not been employed, than have succumbed to the poisonous effects of the latter. So that, considered in this light, the advantages of chloroform greatly preponderate over its disadvantages."—P. 156.

The precautions to be used in giving chloroform by inhalation, and the means to be employed when dangerous symptoms arise, are treated of at considerable length. These matters have, however, recently been brought under the notice of our readers in the review of Dr. Sansom's work on chloroform.[a] We, therefore, think it unnecessary again to go into the subject, more particularly as in the abstract from Dr. Sansom's book, to which we refer, more information will be found in a few sentences than can be extracted from the thirty pages which Dr. Sabarth devotes to the administration of chloroform, and the means of restoring suspended animation. We may mention, however, that the latter author prefers to give the chloroform on a folded towel or handkerchief, believing that with proper precaution this method is just as safe, and less terrifying to the patient, than that in which an elaborate inhaler is

[a] Dub. Quart. Jour., May, 1866, pp. 354; *et seq.*

used.   Some very striking cases are recorded in which, after all the ordinary means had failed to restore the suspended respiratory movements, galvanism succeeded, one pole of the battery being placed over the phrenic nerve in the neck, the other over the origin of the diaphragm.   In one successful case twenty minutes had elapsed from the commencement of the asphyxia before the pulse and respiration were restored.

In the next chapter we find the opinions of authors on the value of chloroform in the treatment of medical diseases.   To enumerate all the maladies in which this drug is said to have been employed with the most perfect success, would be to give the entire nosological list, from hiccup to tetanus and hydrophobia,   We must confess ourselves somewhat sceptical as to its applicability or value in some of the cases in which it appears to have been largely used.   Thus, first on the list stands pneumonia, a disease which seems to lend itself with equal complaisance to swell the tables of successes of every mode of treatment from calomel and blood-letting to homeopathy; and we find the chloroformist as fortunate as Sangrado or Hahnemann.   So, we read, that of 193 cases treated by chloroform inhalation by Drs. Wachern, Baumgärtner, Helbing and Schmidt, only nine died; and that Dr. Varrentrap, of Frankfort, treated twenty-three cases (nineteen exclusively) by chloroform inhalation, and of these only one died.   These results are very encouraging; but in the absence of any details as to the age of the patients, the amount of lung tissue involved, the condition of other organs, and the various other circumstances which, much more than the treatment, make the difference for the patient between life and death, we must confess our unwillingness to repeat the experiments of our German brethren.

In spasmodic affections of the respiratory organs, unaccompanied by structural change, we can readily believe in the advantages to be derived from chloroform.   And under this head we find cases of spasmodic asthma, hooping cough, hysterical cough, laryngismus, stridulus, and hiccup, reported as yielding readily to chloroform inhalation.

In the paragraph on hepatic colic and gall-stones, we find the internal administration of chloroform in solution in alcohol strongly recommended on the authority of M. Bouchut, but are somewhat surprised not to meet with one word advising its inhalation in these circumstances; a mode of exhibition of the drug which would

manifestly be much more efficacious than its internal administration, notwithstanding its vaunted power of dissolving cholesterine.

In these days when cures for cholera abound, our readers will not be surprised to learn that chloroform possesses anti-choleraic virtues unsuspected by many. Not only has it been given with success internally, combined with opium and other drugs, but also by inhalation, and we are directed to keep the patient under its influence until all symptoms indicating danger have passed away.

Fifteen cases of intermittent fever were cured by Bonafont by inhalation of ether or chloroform. The inhalation was employed six hours before the expected attack; if the latter was once escaped completely, further treatment was unnecessary; the cures were all permanent. The patients preferred this mode of treatment to that by sulphate of quinine. In Spain, Poblacion and others have found the internal administration of chloroform useful in intermittents.

In cases of strychnine poisoning, chloroform inhalation has proved itself of great service. The following example is interesting:—A man, 40 years of age, whose habits were somewhat irregular, drank in mistake for morphia, the contents of a bottle which held a solution of strychnia. In twenty minutes the following symptoms manifested themselves:—Rigidity of all the muscles, contraction of the muscles of the back, and of the upper and lower extremities, retraction of the head, difficulty of speech, oppression about the chest, profuse perspiration. The means usually resorted to were fruitlessly employed. It seemed as if the patient would succumb to the severity of the spasms, and death appeared inevitable unless speedy assistance were afforded. Dr. Mannson, at this juncture, administered chloroform. Two grammes were poured on a pocket-handkerchief, which was held so that the patient could conveniently inhale the vapour. He was then in the sitting position supported by many assistants, but soon desired to be laid in bed. The inhalation was continued off and on for many hours, the patient himself holding the handkerchief to his nose in order, as he said, to cut short the cramps. These gradually disappeared, and after two days the patient was perfectly well and able to resume his usual occupation.

In a physiological digression the author explains the presence of sugar in the urine, after the inhalation of ether or chloroform, by the impairment of respiration, which interferes with the supposed combustion, in the lungs, of the hepatic sugar. That the diabetes is not due to a reflex influence exerted through the pneumogastric nerves on the medulla oblongata, is shown by dividing the vagi in

the neck of a rabbit, previous to the commencement of the inhalation, after which sugar appears in the urine just as if no operation had been performed. The diminution of animal heat, which Duméril and Demarquay have shown to be consequent on the inhalation of ether or chloroform, is independent of respiratory disturbances, and is supposed by the author to be caused by a specific action exerted by the anesthetic on the nervous system.

This chapter terminates by a consideration of the combined influence on the body of chloroform and morphia. A combination of these for internal administration may be prepared as follows (Bernatzik):—One part, by weight, of morphia is dissolved in two parts of rectified wine vinegar and twenty parts of rectified spirit of wine, and the solution, when cold, is mixed with eighty parts of chloroform—one drop contains the $\frac{1}{500}$ part of a grain of morphia. Dose for a child, two to fifteen drops; for an adult, thirty to forty drops. It is said to give relief in most painful affections much more quickly and certainly than morphia alone, and to leave none of the unpleasant after effects of opium. The subcutaneous injection of morphia, during chloroform narcosis, is strongly advocated in all those cases where it is desirable to maintain the state of unconsciousness for a lengthened period.

In the following chapter, some of the more important surgical applications of chloroform are considered. In operations about the mouth the patient is often deprived of the advantages of anesthesia through fear that suffocation might ensue from passage of blood into the larynx. The general opinion appears to be that such fear is exaggerated. Chassaignac advises us to watch for the moment at which, when the patient is recovering from the influence of the chloroform, consciousness awakes, while sensation is still in abeyance. If at this moment we make our incisions the patient feels no pain, and at the same time is sufficiently his own master to reject the blood which accumulates in his mouth, and to prevent its entrance into the air passages.

On the importance of chloroform in operations on children, in facilitating the taxis of hernia, and the reduction of dislocations, it is unnecessary to speak. The uses of chloroform, applied externally, for the production of local anesthesia, the cure of itch, &c.; and as a solvent for different substances, specially gutta percha and camphor, are briefly noticed at the end of this chapter.

With regard to the administration of chloroform in operations on the eye, the generally received opinion is that it is applicable in

almost all cases except those in which the globe is largely opened, as in flap extraction of cataract. Here, the danger of prolapse of the iris with loss of vitreous, and perhaps separation of the retina and choroid, is so great, should vomiting occur, as to render the employment of chloroform extremely hazardous. We find, however, Jacobson advocating its use in cases of flap extraction as being perfectly free from danger, and as greatly facilitating the performance of the different steps of the operation. He says that by suitable regulation of the patient's diet, previous to the operation, and by the use only of pure chloroform, the occurrence of vomiting may be, in most instances, entirely prevented, and in those few cases where it does occur it may, by proper care on the part of the operator and his assistants, be rendered perfectly harmless for the eye. He supports his opinions by the results of 150 cases of flap extraction, in which chloroform was employed without ill effects.

The chapter on the uses of chloroform in midwifery practice is quoted almost entirely from Scanzoni. This writer disapproves of the administration of chloroform in perfectly natural labour, but in those cases in which it is necessary to moderate uterine action, and in most obstetric operations, he strongly advocates its employment. Of some novelty is his recommendation of chloroform as a means of warding off a threatened abortion or miscarriage. He relates a case in which uterine action had continued for some time, and the os was dilated to the size of a silver groschen. After inhalation had been maintained for half an hour the pains ceased entirely, the os quickly closed, and the patient went to her full time without further accident. She was a primipara; the threatenings of abortion had come on after a severe mental emotion; the period of her pregnancy is not mentioned. Scanzoni thinks also that in eclampsia chloroform is of service, not only in diminishing the severity and frequency of the fits, but also in helping to preserve the life of the child, which is generally lost, not by uremic poisoning of its blood, but by the interruption of the nutritive processes between the mother and child, produced by the spasmodic contraction of the uterine walls during the attacks. This spasm, the author thinks, can be mitigated by the use of chloroform.

The last chapter contains the history of the *post mortem* appearances of persons dead from chloroform inhalation. As has been already stated, with the exception of flaccidity and bloodlessness of the heart, the appearances are not characteristic of the cause of death.

On the whole, the work before us leaves, after its perusal, a somewhat unsatisfactory impression on the mind. Out of the mass of heterogeneous, and often contradictory, opinions contained in it, it is difficult to choose the good and true, and to reject that which is fanciful, or founded on insufficient observation. We think that those who wish to learn what is really known on the subject of chloroform will do better by consulting a book written by a single author, than one made up of cuttings from the writings of many. At the same time we would acknowledge the value of the present work as a contribution to medical bibliography.

A Practical and Theoretical Treatise on the Diseases of the Skin. By GEORGE NAYLER, F.R.C.S., Assistant-Surgeon to the Hospital for Diseases of the Skin, Bridge-street, Blackfriars 8vo. London: Churchill & Sons. 1866.

THIS volume consists of 292 pages of large type, on toned paper; and, besides plates, to which we shall afterwards advert, it comprises twenty-two chapters, of which we shall endeavour to give a short analytical outline.

Chapter I.—" On the Anatomy and Physiology of the Skin"— covers 21 pages, with an amount of matter which, in our opinion, is not at all necessary or desirable in a book of this kind. Any one who studies the subject of cutaneous medicine is presumed to know something of the anatomy and physiology of the skin, or at least to know that in anatomical and physiological works is the proper place in which to look for such information. If a man write a book on diseases of the heart, or of the liver, or of the kidneys, he is not expected to preface his treatise with an anatomical primer taken from the received writers of our own day.

Chapter II.—" On Psoriasis and Lepra"—treats of substantially one affection under the two names; and the mode of arrangement adopted by Mr. Nayler in each chapter may be well illustrated here. We first are told of the varieties of psoriasis, and then of its general characters and situation; its hereditary tendency and causes are next treated of; and here Mr. Nayler observes (p. 24):—" I am able to confirm the statement of Neligan, that psoriasis sometimes appears in the collateral branches of a family, while the immediate descendants are free from the disease. It is more common, however, to find it invade in the direct line." Mr. Nayler now proceeds

to discuss the relative frequency of psoriasis in the two sexes; enters on the question of diagnosis; speaks of *psoriasis annulata;* syphilitic psoriasis; the absence of scales in syphilitic psoriasis; of ps. *prominens;* of the question of prognosis; and of treatment, particularly as regards salines, arsenic, and mercury used internally, and the local use of carbolic and nitric acids, and many other remedies. He recommends a lotion of carbolic acid, consisting of 14 grains of the acid, half an ounce of spirits of wine, and an ounce of glycerine, and a pint of water. Mr. Nayler does not omit to mention the use of baths in this disease; and he adverts to the question of diet; concluding Chapter II. with notices of the various varieties of psoriasis.

Chapter III.—" On Pityriasis"—does not contain anything new, and may, perhaps, be looked on as giving the views of Mr. Startin, Mr. Nayler's teacher. P. rubra and p. nigricans are given as having been " noticed by Cazenave, Startin, and others;" " but " he adds, " these are exceedingly rare." Mr. Nayler maintains the opinion that " *pityriasis versicolor*, or chloasma, is of parasitic origin."

Chapter IV.—" On Icthyosis"—contains a variety of statistics respecting this disease. Under the head of " Icthyosis of the Tongue" we read (p. 62):—" Mr. Hulke has recorded a case of icthyosis of the tongue in a man, a patient at the Middlesex Hospital, who had it upwards of fourteen years. It differed from a corn in its tendency to increase at its margin. The treatment consisted in paring [*sic*] at intervals, as much of the upper part of the growth as could be removed without injury to the tongue." The condition of the urine in icthyosis is carefully noted, and tabular statistics of experiments, made by himself, are given by Mr. Nayler. They show that the specific gravity in such cases is low; while " notwithstanding the small rate per cent. of urea, the absolute amount in twenty-four hours is little altered in icthyosis; and this is somewhat remarkable when we consider that the skin, as a secreting organ, is reduced to the lowest possible limits, in the disease. This fact militates against the usually received theory of the elimination by the skin of urea (p. 65)."

Having disposed of diseases " of the squamous class," Chapter V. enters on the discussion of " papular eruptions," which, we are told, comprise *lichen* and *prurigo;* and include under the former, *strophulus*, or gum rash." Two pages of Chapter V. are occupied in describing *lichen scrofulosus* and *lichen ruber*, of Hebra, to whose article on the subject, in Virchow's Handbook, the reader is referred for further information.

Chapter VI. treats of prurigo; and Mr. Nayler here maintains that:—" No form of prurigo is in any way dependent on pediculi, although their presence may greatly aggravate the symptoms." The opinion of Alibert, which Mr. Nayler here opposes, and which opinion, he remarks, has been lately revived, is further referred to in a foot note on p. 86, where, admitting the coexistence of pediculi and prurigo, in the lower orders of the people, he observes:—" There is probably no disease of the skin so common in the highest range of society as this variety of prurigo."

Chapter VII. treats of eczema; and, in our view, it is singularly deficient as regards this disease. In a dogmatic manner the disease, which is perhaps the most frequent of all other cutaneous affections, is pronounced *vesicular;* and there is not a word in the entire chapter to indicate that such a thing as controversy regarding the nature and extent of eczema exists. We are quite sure that Hardy and Hebra, and M'Call Anderson, and Fox, and other writers of our own day, will think little of this chapter.

In Chapter VIII.—" On Herpes"—Mr. Nayler maintains that herpes circin*n*atus (for so he spells the latter word) and tinea tondens are one and the same; and he further holds that the affection (h. circinatus) is parasitic. As to its cure, Mr. Nayler mentions as successful the plan adopted by Mr. Coster, Medical Superintendent of the London District School, at Hanwell. It consists of the application of tar and iodine, an ounce of the former to two drachms of the latter; and he gives the mode of its application in a foot note on p. 123.

Chapter IX.—" On Pampholix"—which he regards as synonymous with pemphigus, concludes Mr. Nayler's remarks on vesicular affections; and in Chapter X. he commences on diseases of the pustular class, with porrigo; continuing, in Chapter XI., with impetigo; and concluding, in Chapter XII., with ecthyma and rupia. The porrigo of Mr. Nayler is not the porrigo of Neligan and others (See Dr. Belcher's edition of Neligan, p. 404), but appears to be merely a variety of impetigo. Accordingly, we are not surprised to find him saying, on p. 138, that he has been unable to discover a vegetable parasite in porrigo; but he adds that in numerous cases which he has seen the hair bulbs become flattened, and expand into a broad and thin plain, which terminates in an even edge. He appends microscopic diagrams to illustrate this statement.

Chapter XIII. treats of Lupus; and while it mentions in a passing manner the plastic operations of Mr. Hamilton, of this

city, it wholly omits mention of Jacob's ulcer, which Neligan included under lupus devorans.

Chapter XIV.—" On Alopecia"—is better, in most respects, than the corresponding parts of other works on this portion of the subject, because it discusses the question—which it answers in the negative—is alopecia a parasitic disease? and gives microscopic diagrams in illustration.

In Chapter XV.—" On Acne "—Mr. Nayler derives the term acne from the Greek α, non, and κναω, radere, viz., freedom from itching. Without entering into a critical discussion on Greek derivations, we must, with all respect, dispute Mr. Nayler's Greek on this point, and prefer Dr. Belcher's derivation—that usually accepted—as given in his edition of Neligan, p. 173:—" Acne is derived from ἀκμή, from its appearance at the full growth and evolution (acme) of the system."

Chapters XVI., on Sycosis, and XVII., on Favus (the porrigo of Neligan) do not call for any particular remark; and we next proceed to Chapter XVIII., on Scabies and Pediculi. This contains several large representations of the acarus scabiei, and of the pediculus corporis humani. Mr. Nayler looks on scabies as *always* caused by the presence of the acarus; and while he recommends the use of the hyposulphite of lime (so common in our military hospitals) for its cure, he seems to think the use of that preparation more modern than it really is. Its use was mentioned in this Journal in 1862; and even then it was not new.

Chapter XIX. treats of Uticaria and Erythema; and Chapter XX. of Elephantiasis. Chapter XXI. notices various " morbid growths of the skin"—as, for example—warts, fibrous, sebaceous, and other tumours; and Chapter XXII., which concludes the book, consists of " Remarks on diseases of the Skin following Vaccination." Mr. Simon, in his papers on vaccination, published in 1857, and presented to both Houses of Parliament, strongly contested the theory of the transmission of syphilis by vaccination. Mr. Nayler, however, believes that cases occur in which there is no room for any other opinion than that syphilis has been transmitted through the medium of vaccination.

There are seven plates prefixed to this volume. Five of them are illustrations of the anatomy and physiology of the skin; and, in fact, appear to have been the pegs for hanging Chapter I. on. The remaining two are microscopic views of parasites.

The classification, or absence thereof, in this book is curious,

and indicates a reaction from the intolerable classification-making of modern writers. Mr. Nayler praises Willan's classes, as every one else does; and, for the most part, he leaves them after him, as do his brother writers. Begging the question, and proving nothing as to what diseases are, respectively, squamous, papular, vesicular, and pustular, he devotes a chapter to each of these groups, and gives one also to each of the remaining diseases " which have their own distinctive characters." According to the modern meaning of the word " Treatise," this book, which is good, so far as it goes, has no proper claim to be called by that comprehensive term. Omitting some diseases altogether, it almost wholly ignores the important labours of other modern writers, except, perhaps, Mr. Startin, and now and then, a man whom no one can afford to ignore—Erasmus Wilson; rarely cites an authority; and quietly omits mention of some prevailing opinions which every well informed practitioner should know something about. The ill-natured critic has some ground for asking—if the drawings and illustrations already noticed had not been in existence previously would this book have been written? If it had been called " A Treatise on the Anatomy and Physiology of the Skin; with Remarks on the Parasitic Nature of Some of its Diseases, and the Treatment of Others"—it would have been well called so.

While thus reflecting on some of the defects of this book, and wondering where the eruption of books on dermatology will end, it is but fair to say that the practical recommendations of Mr. Nayler are sound and useful; the descriptions of disease, for the most part, are clear and concise; and in the important matter of diagnosis his book may be consulted with advantage.

The Use of the Laryngoscope in Diseases of the Throat, with an Appendix on Rhinoscopy. By MORELL MACKENZIE, M.D., London; M.R.C.P; Physician to the Hospital for Diseases of the Throat; and Assistant Physician, and Co-lecturer on Physiology at the London Hospital. Second Edition, Revised and Enlarged.

THE volume which has just come to hand is both a surprise and a pleasure. It is not often our pleasing duty to call our professional brethrens' attention to a second edition, revised and enlarged, within

so short a space of time. We reviewed the first edition in our February Number of 1865. We then stated, that we felt sure of the success of the book, as it supplied a want. The result has proved the correctness of our opinion.

The arrangement of the volume before us is the same as the first edition; but each chapter is enlarged by the addition of more information, and enriched by many additional well executed engravings.

Mackenzie, as almost every one now does, gives the credit of the Laryngoscope, as it is now used, to Czermak:—

"In the year 1857, in the month of November, Professor Czermak, of Pesth, borrowed from Dr. Türck the little mirrors which that gentleman, in spite of the exhortation of his friends, had thrown aside as useless. In a short time his superior genius, untiring perseverance, and natural dexterity, enabled him to overcome all difficulties. When the dentist's mirror passed into the hands of Czermak, the examination of the larynx was dependent, so to speak, on the clocks and the barometer; but he soon relieved it from both these troublesome monitors. Artificial light was substituted for the uncertain rays of the sun; the large ophthalmoscope of Ruete, was used for concentrating the luminous rays; the awkward hinge which united the laryngeal mirror to its stem was dispensed with; and the mirrors were made of different sizes. Thus it was that Czermak created the art of Laryngoscopy."

The second chapter treats of glasses, reflectors, and lamps; of the first, the author prefers the circular forms, except when enlarged tonsils are present; he then prefers oval mirrors.

The reflector may be placed in different positions, either

Opposite one eye (Czermak);

In front of the nose (Bruns);

Or on the forehead (Fournié, Johnson, Mason, &c.).

Of these, the first is the most perfect; the last the easiest in practice.

"Any lamp that gives a bright steady light answers the purpose perfectly well."

For those who want more, Dr. Mackenzie has a rack-movement laryngoscopic lamp, which admits of perpendicular and horizontal movement. He adds:—"The power of the light may be advantageously increased by one or more lenses placed in front of the flame." We very much question the advantageousness of the

increase of light; we have been very glad to diminish the light of our own "moderator" after several examinations; and if we have light enough to see distinctly all that is to be seen, more light only injures the sight of the examiner. The next lamp, however, is a very valuable contrivance:—" It consists of a small metal cylinder, three and a half inches long, and two and a half in diameter. This is closed at one end, and at the other there is a plano-convex lens— the plane surface of which is next the flame. The lens is two inches and a half in diameter, and is about one-third of a sphere. In the upper and under surfaces of the cylinder (opposite each other) are two round apertures." These holes are so placed that the flame is at the focal distance from the lens. At the lower part of the tube are two semicircular arms, which, by means of a screw at the side, can be made to grasp tightly the largest lamp chimney, an ordinary candle, or even the narrow stem of a gas jet. The practitioner can carry this light concentrator in his pocket, and always feel certain of being able to illuminate the fauces.

The third chapter treats of the art of laryngoscopy, and first of reflection. It seems to us very unnecessary dwelling on inversions in laryngoscopy, and quite sufficient for the operator to bear in mind that he is looking into a mirror while he is operating on the real object. In the daily operation of shaving does the operator ever think of inversions when he steers clear of his favourite pimple? Does he not simply fix his eye steadily upon it, and guide his razor with a steady hand in every direction, carefully avoiding its sacred precincts? In exactly the same manner should the laryngoscopist guide his forceps, and never once think of inversions. Let our reader try the experiment, and see if he does not give himself a cut where he thinks how his face is reflected and what parts of it are inverted.

It is unnecessary to enter into the practical descriptions, as every laryngoscopist should provide himself with the work.

Numerous ingenious contrivances are described and delineated in the following chapters.

We would, before concluding our necessarily brief remarks, call our readers' attention to Dr. Mackenzie's most valuable invention, by means of which galvanism can be applied directly to the muscular apparatus which moves the vocal cords:—" By a very simple contrivance the electric current can be applied directly to the vocal cords. The important feature in the laryngeal galvanizer

is, that the current does not pass beyond the handle till the sponge is in contact with the vocal cords. . . . Its employment is indicated in functional aphonia, and in most cases of vocal weakness, where there is no structural disease."

Dr. Mackenzie has published a short work on this subject, entitled *The Treatment of Hoarseness and Loss of Voice by the Application of Galvanism to the Vocal Cords.*

In conclusion, we wish this edition the same success as the first. The importance of the subject to *every medical man* is daily becoming more felt, and though every practitioner cannot become such a proficient as to enable him to operate with facility, yet the most over-worked can in a few days master sufficient to enable him to make a correct diagnosis, and not treat every sore throat with a sponge full of caustic wash inside and a fly blister or iodine outside.

The number of laryngoscopes which have been sold within the last year to medical men in the country parts of Ireland shows with what earnestness Irishmen take advantage of the progress of science; to each of these we would say, get the second edition of Mackenzie.

We are glad to see by an advertisement in the front of the volume that the diseases of the throat which we promised our readers in our review last year, is in the press. If it rivals its predecessor the two volumes will form a complete manual of laryngoscopy.

On Diseases of the Respiratory Passages and Lungs, Sporadic and Epidemic: their Causes, Pathology, Symptoms, and Treatment. By WALTER GOODYER BARKER, M.B. Lond.; Senior Medical Officer to the Worthing Infirmary; Fellow of the Meteorological Society, &c. London: John Churchill & Sons, New Burlington-street. 1866.

THE object of this book being professedly to bring before the notice of the profession a cause of disease, and especially of lung disease, sporadic and epidemic, which Dr. Barker considers is not sufficiently recognized, viz., atmospheric vicissitudes; and, particularly, as in his preface he claims consideration for his views, the result of fifteen years' close attention, we naturally expected this subject to be largely dwelt upon, and exhaustively handled. We are sorry, however, to say that our anticipations have not been

fulfilled; and we find more written on the symptoms and the treatment of diseases than the cause producing them.

Dr. Barker, apologizing for affixing to his book such a high sounding and comprehensive title, explains that his original intentions were very circumscribed, but that, as he proceeded, he found so close a connexion between *cause* and *effect*, it would have been impossible to have demonstrated the one without giving a description of the other, and then, by a necessary consequence, he was led to speak of the remedies.

To his conclusions, as to the meteorological causes of most, or indeed of all, lung diseases, he was inductively led—1st. By a constant observation of the causes of coryza, not merely the normal atmospheric changes which produce this affection, but also the artificial mode of living, which exposes us to so great fluctuations of temperature. 2nd. By observing that, as a rule, diseases of the respiratory apparatus are ushered in by little or no constitutional disturbance, this being consecutive to, and in accordance with, the local disorder. And 3rd. By the greater frequency of coryza, compared with bronchitis, and this latter with pneumonia, the difference corresponding, as Dr. Barker supposes, with the exposure of each part to the external atmosphere.

Diseases of the lungs Dr. Barker divides into four classes.

I. Those which have their origin chiefly or altogether in the immediate contact of the atmosphere upon the diseased part. Under this head he treats of coryza, laryngitis, tracheitis, bronchitis, and pneumonia.

II. That which is produced by the application of cold to the surface of the chest, viz., pleurisy.

III. Epidemic disease, as influenza, hooping-cough, and measles.

IV. That which arises from constitutional causes, either hereditary or engendered, viz., phthisis.

In Chapters III. and IV. laryngitis and tracheitis are considered under three heads, according as inflammation attacks the epithelial lining of the larynx and trachea, the basement membrane, and the sub-mucous areolar tissue. Under this last comes croup. Dr. Barker's views of this disease are thus expressed:—" There is no reason to suppose that there is anything specific in the nature of this disease, or that it is limited to the trachea, but rather that the formation of a false membrane is owing entirely to the severity of the inflammation by which plastic lymph is thrown out. This lymph is allowed to accumulate, on account of the feeble expulsive

power of infantile life, and, therefore, becomes moulded to the trachea." The small size of the larynx, and the undeveloped nares of the infant, so that the air cannot be sufficiently altered as regards temperature and moisture, before coming in contact with the mucous membrane of the trachea, are additional reasons why it is so often a disease of childhood.

With respect to the particular condition of the atmosphere under which the disease is lighted up, Dr. Barker's inquiries have almost invariably enabled him to trace its origin to exposure to a cold dry air. The few cases which had occurred in his own practice had always taken place in the Spring of the year, and with the prevalence of an easterly or north-easterly wind; while he has never known a case to occur when the wind blew from the south, south-west, or west.

Passing by an uninteresting chapter on bronchitis, acute and chronic, we come to one on asthma, in which we certainly expected to see the subject of the connexion of this disease with atmospheric phenomena fully discussed, but, beyond a casual one, no mention is made of the atmospheric vicissitudes being its cause; and knowing the great benefit asthmatic patients derive from change of air from the sea-side to the interior, from the country to town, and even to particular parts of town, we are sadly disappointed to find the subject thus summarily dismissed:—" With respect to the atmosphere and locality best suited to the asthmatic, there is so much variety of opinion, and so much caprice in individual cases, that no rule can be laid down."

As neither time nor inclination permits us to give a full synopsis of this work, we intend merely touching upon a few additional subjects, from which the author's views can best be gathered.

In the chapter on pneumonia, Dr. Barker writes:—" Bronchitis and pneumonia, viewed as to the cause, may be considered as the one disease, differing only in degree." Learning that such is his opinion on this all-important affection of the lung, we are not surprised to read that, in the first stage, of Laennec, he treats his patients, as he does a case of acute bronchitis, by bleeding, active purgatives, antimony, and bringing him under the influence of mercury. As this line of treatment is so directly opposed to that now almost universally recognized, especially in the asthenic type of disease so prevalent at present, we can easily understand how beneficial, if not absolutely necessary, the tonic treatment he advises in the third stage will prove.

The most interesting part is that in which Dr. Barker treats of epidemic disease, and penetrates, in particular, the mysteries of influenza. The views hitherto entertained on the subject of its cause he shows to be erroneous, and unsupported by observation. Influenza was attributed at first, in 1633, to a dense fog, by Paulini; to thick sulphurous vapours, by Læu, in 1729; to electric and telluric phenomena, in 1732–37; some combinations of selenium, being assigned as its cause, by Dr. Prout; and by Weber a negatively electrical state of the atmosphere. In 1847, Dr. Peacock considered it due to a poison of a telluric or atmospheric character. Later still, ozone was thought its cause; and, lastly, Dr. Barker advances atmospheric vicissitudes. " I approach," he writes, " this subject with some diffidence, because the opinions that will be advanced are not only opposed to those of the wisest and best of our profession, but, so far as I have been able to discover, of every medical man who has written on the subject." Its nature, he considers, may be thus briefly expressed:—" Influenza is coryza associated with inflammation of the fauces, pharynx, larynx, trachea, and upper bronchi; and, in more severe cases, of their minute ramifications;—and if there be further extension of it, to the air sacs, we say it is complicated with pneumonia." And further on he writes:—" Influenza has no essential character whatever."

After some eight pages devoted to proving the causes of the severe and terribly fatal results of influenza to be the same as those which intensify the other scourges of mankind, viz., cholera, typhus, scarlatina, &c., he asserts, without, we think, anything like conclusive reasoning, that the *essential cause* of this disease is exactly the same as that of coryza, namely, the sudden fluctuation of the temperature of the atmosphere, and especially the cold of the north and north--east winds, and differs from coryza alone in degree—as the cause is an exaggerated one, the effects, therefore, are exaggerated.

Hooping-cough is alike referred to the same source; but, as if Dr. Barker had not ridden his hobby enough, he astonishes us by classifying *measles* with influenza and hooping-cough. He says:— " The exciting cause of measles is undoubtedly the same as of *other lung diseases*" *!* The only reason we can see brought forward for this novel and startling theory is the circumstance of the respiratory organs being invariably affected in each.

We have now come to the close of our review, already too long, and without further comment leave the worth and usefulness of such a work to the individual judgment of the reader.

Cancer: A New Method of Treatment.   By W. H. Broadbent, M.D., London; Assistant-Physician to St. Mary's Hospital; and Lecturer on Physiology at the St. Mary's Hospital Medical School.   London: John Churchill & Sons.

"He who attempts to make others believe in means which he himself despises, is a charlatan; he who makes use of more means than he knows to be necessary, is a quack; and he who ascribes to those means a greater efficiency than his own experience warrants, is an impostor."—Lavater.   *Aphorisms on Man.*

We wish to draw attention, by a few lines, to Mr. Broadbent's new treatment of cancer. Few who have closely studied the reagents which affect the cancer cell will have escaped the momentary impression that in acetic acid there was a remedy for the disease, if it could be brought into contact with all the component cells of a cancerous tumour. This preliminary difficulty Mr. Broadbent thinks he has surmounted by a process of hypodermic injection. We shall let him speak for himself:—

" The hypodermic syringe is now in the hands of every physician, and it seemed to me that by means of this instrument, some fluid might be injected into the tumour which might so far alter its structure, and modify its nutrition, as to retard or arrest its growth. Various substances presented themselves to my notice, and acetic acid was selected for the following reasons :—

" 1. This acid does not coagulate albumen, and might therefore be expected to diffuse itself through the tumour. The effect would thus not be limited to and concentrated in the point injected.

" 2. If it entered the circulation it could do no harm in any way, either by acting as a poison or by inducing embolism.

" 3. Acetic acid rapidly dissolves the walls and modifies the nuclei of cells on the microscopic slide, and might be expected to do this when the cells were *in situ.*

" 4. It had been applied with advantage to open cancer and to cancerous ulcerations.

" The experiment was made, and it was found that acetic acid, though in healthy tissues it causes very severe smarting and burning, unless very strong, gives little pain when thrown into malignant structure. On the other hand it acts energetically on cancer, but has comparatively little effect on normal structure."

The cases of this method given are but four in number, and their

results are but moderately satisfactory   Other cases have been re-
corded in the journals, and in time a sufficient number of experiences
on the matter will be brought together (perhaps in a future pamphlet
by Mr. Broadbent) to enable the profession to form a judgment of
this method.   While we refrain from expressing any sanguine hope
as to the value of this particular treatment, we hail all such sugges-
tions as steps towards the ultimate discovery of a method, or
methods, to check the growth of this most fearful disease; espe-
cially where, as in the present instance, they are free from all
suspicion of the "charlatanism, quackery, and imposture" which
Mr. Broadbent deprecates in his quotation from Lavater.   Mr.
Broadbent has given a stimulus to other observers, and we are
aware of various fresh efforts which are being made to solve the
important problem of the curability of cancer.   Of the results of
these investigations it will be our duty to keep our readers duly
informed from time to time.

A Treatise on the Practice of Medicine.   By GEO. B. WOOD,
    M.D., LL.D., &c.   6th Ed.   2 Vols.   Philadelphia: Lippin-
    cott & Co.   1866.

WHEN a book has reached the sixth edition what more need be
said about it.   We have examined this one carefully, and find it
brought fully up to the level of the day, and in every respect fitted
to maintain the high position already attained by this favourite
class book.

PART III.

MEDICAL MISCELLANY.

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Reports, Retrospects, and Scientific Intelligence.

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PROCEEDINGS OF THE PATHOLOGICAL SOCIETY
OF DUBLIN.[a]

Dr. R. W. Smith, President.

Popliteal Aneurism.—Dr. Fleming said that the case which he begged to lay before the society was one of popliteal aneurism, in which the treatment by compression was apparently advancing satisfactorily, although slowly, when, suddenly, the aneurism became diffused, and it was decided to tie the femoral artery. Suppuration of the sac subsequently supervened, and violent hemorrhage having taken place into it, amputation of the thigh was performed.

The subject of the case was a man aged between thirty and thirty-five years. He had been a guard on one of the Irish railways, and about twelve months back, whilst engaged at his usual duty, forcibly pushed his right foot against the door of a third class carriage in order to shut it, when he felt a most painful sensation in the ham and on the outside of the corresponding thigh and leg, extending to the foot,

Although suffering much pain he continued for two or three days at his employment, when, at the end of that time, he perceived a small tumour in the popliteal space about the size of a bean. This tumour gradually increased, yet he continued at his work for the succeeding six months, at the end of which period he was obliged to apply for relief, and was admitted into the Richmond Hospital in the last week of June. All the essential features of aneurism of the popliteal artery were present. The tumour was about the size of a large orange, and occupied the inferior angle of the popliteal space. It was uniformly smooth on its surface, had a strong expansive pulsation, and a distinct systolic bruit. These signs were completely controlled by pressure on the femoral artery at the pubis ; and the sac of the aneurism, moreover, was completely emptied.

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[a] These reports are furnished by the Secretary to the Society.

rapidly refilling on the removal of the pressure. The man was tall in stature, had an anemic look, and from his history was decidedly of a rheumatic habit. During his stay in hospital he had repeated attacks indicative of this diathesis at irregular intervals, which necessarily interfered with the treatment of the aneurism. The sounds of the heart were natural; its action, however, was feeble and unsteady, and he had precordial uneasiness, with occasional faintness, almost amounting to syncope.

Shortly after his admission into hospital he suffered considerable abdominal uneasiness, often specially referred to the left lumbar region, and accompanied by symptoms strongly simulating the passage of a renal calculus, and materially influencing the condition of the urine from the large amount of lithates present. These symptoms yielded to ordinary remedies; and on their subsidence the treatment of the aneurism by compression was carried out in the most extended application of that term. Throughout it there was not the slightest indication of œdema of the limb, and the pulsation of the tibial artery was perfectly ascertainable. There were occasional interruptions to the compression from local annoyances unnecessary to particularize; when, in the beginning of September, a most obvious change had taken place in the aneurism. It was diminished in size; it was solid in consistence, and its pulsation was extremely feeble; in fact, there was every reason to anticipate its ultimate cure; and my colleague Professor Smith, entertained the opinion that a cure would be effected in the same manner as in a case lately under his care, where the remnant of the aneurismal sac permitted of the passage of the blood through it, a small pulsating tumour being persistent.

About this time it became quite evident that the aneurism had given way, not alone from the sensation of the patient, but also from the altered condition of the popliteal region. Pulsation was distinctly traceable in it, but there was a tense swelling, which not alone occupied the ham, but also extended along the inner and lower fourth of the thigh and the upper part of the calf of the leg. Deligation of the femoral artery was decided upon; and it may be here remarked that the several stages of the operation were materially complicated by the local effects of the compression, which, influenced not alone the depth of the artery from the surface but also the condition of the sheath, the areolar tissue between the artery and the vein being deeply ecchymosed. Two arteries were tied, the first in the line of the femoral, with its anatomical relations, obvious to all present, only producing a temporary suspension of the pulsation in the aneurism, when a second was discovered, external to, and on a place posterior to it, around which a ligature was passed, completely and permanently obliterating the pulsation in the aneurism.

The progress of the case for the succeeding fortnight was most

satisfactory; and at the time of the separation of the respective ligatures—one on the 14th, the other on the 18th day—every hope was entertained that the absorption of the contents of the diffused aneurism was being effected, when the ordinary signs of suppuration of the sac manifested themselves. An opening was made into it, and a quantity of dark grumous fluid, mixed with a few flakes of coagulated blood, escaped; and again, from day to day, sanguine hopes were being entertained of a favourable result, when, suddenly, it was accidentally perceived by the man that some fluid was passing along the limb, and on examination all about was found saturated with bright arterial blood. The hemorrhage was temporarily controlled; but quickly recurred, and escaped by large masses of semi-coagulated blood. There was now no alternative, amputation of the thigh alone affording any prospect of saving life.

Dr. Fleming now directed attention to the prominent pathological features disclosed by the dissection of the amputated limb. The amount of œdema was trifling. In the calf of the leg betwen the gastrocnemius and soleus muscles an enormous sac, filled with dark coagulated blood, was visible. It extended throughout the popliteal space, and along the inner hamstring muscles, completely obscuring the artery and vein, and the aneurismal tumour, now reduced to the size of a walnut. There was a rent at its inferior portion, and a total deficiency of arterial structure for at least an inch and a-half between it and the posterior tibial artery. The popliteal, about two inches above the sac, presented two small aneurismal dilatations. The remainder of the sac contained laminated coagula.—*November* 24, 1866.

Gangrene of the Lung.—DR. LEET exhibited a recent specimen of gangrenous abscess of the lung taken from the body of Corporal King, 9th Lancers, who was admitted into the General Military Hospital, Dublin, November 10, 1866, from his Regimental Hospital, Arbourhill, with the statement that he was a well conducted soldier, of temperate habits, and had been in hospital six days with influenza; but severe rigors having set in on the 8th instant, he was sent up to the garrison fever wards.

On admission he appeared like a man in delirium tremens; face flushed; eyes congested; tongue coated with moist white fur, and trembling when protruded; skin hot and sweating; pulse 110, soft and easily compressible; bowels confined; manner excited; constantly asserting that he sees faces looking at him through the windows. Careful examination of the chest fails to detect anything abnormal in the physical signs, beyond a few sonorous râles in both bases posteriorly. He has had no sleep for two nights.

November 11.—Tongue and skin same as yesterday; had one thin

motion; heart's impulse feeble; pulse 112, irregular; bronchial râles increasing, but no dulness on percussion; urine scanty, deep red colour, no deposit; prostration considerable.

November 14.—Several large maculæ, fading under pressure, are observed coming out to-day on the trunk; all the symptoms of well marked typhus fever are now present; urine daily measured and examined, contains excess of urea.

November 17.—During these three days the fever has been increasing in severity; prostration greater; has constant muttering delirium; tongue coated with brown fur; unable to sit up from feeling of syncope; secondary pulmonary congestion not increased; chest has been examined every day.

November 19.—Marked improvement in the general strength, and the eruption is not so livid, though it is now permanent under pressure, and a few petechiæ have appeared on the chest posteriorly. He complains of severe catching pain, during inspiration, below the right nipple. There is no dulness on percussion, but a loud coarse friction sound at that point, and posteriorly over lower half of right lung; well marked comparative dulness; bronchial respiration and bronchophony; the sonorous râles, so distinct yesterday morning, have disappeared; respiration audible throughout left lung, accompanied with muco-crepitating râles; respiration 36; pulse 112, feeble as usual; has occasional distressing paroxysms of coughing; expectoration very scanty; frothy mucus.

November 21.—Was seized with severe rigors, followed by sweating; at 11 a.m., he says the chest pain is now slight, but he has difficulty of breathing. A physical examination of the chest, gave the following:— *Right side*—posteriorly, slight comparative dulness; the bronchial respiration and bronchophony have given place to coarse vesicular breathing and intense moist râles anteriorly; at seat of pain all friction sounds gone; respiration almost inaudible from clavicle to mamma, and percussion note remarkably clear; left lung congested as usual; sputa scanty, purulent, not fetid; extensive suppuration in the cellular tissue around the left parotid gland; the abcess was now lanced, and discharged healthy pus.

November 25.—During the last four days the poison has been getting the mastery, and nature giving ground, ague-like paroxysms are continuing; prostration is very great. It is to be regretted no examination could be made posteriorly, as no doubt the physical signs would then clear up the diagnosis, but he implored not to be moved on to either side, the coughing would become so distressing and the chest pain so intense. The front of the chest has been daily examined, the percussion note, from clavicle to nipple, has been increasing in clearness, and is now decidedly tympanitic; respiration is quite inaudible, and no amphoric phenomena present; delirium, brown tongue, dusky face, livid eruption, and dark

purulent sputa, with occasional diarrhea, show how the typhoid state is deepening.

November 28.—Extremely prostrate ; dyspnea greatly increased ; cannot expectorate ; pulse 120, thready ; but intellect clear ; all delirium gone ; chest full of muco-crepitus ; suddenly complained of acute pain in the chest, and almost immediately died.

Post mortem examination twelve hours after death—body greatly emaciated ; mulberry eruption and petechiæ all over trunk. On removing the skull-cap four ounces clear fluid escaped, and on removing the brain five ounces more ran out from its base. Brain and membranes apparently healthy. On opening the thorax, gas escaped from right pleural cavity ; the lung was greatly contracted, lying up against the vertebral column, and half concealed by two pints of purulent fluid. The right pleura costalis had not lost its smooth polished appearance ; it was moist and thin, and could be easily detached from the costal cartilages. No pleuritic adhesions on either side of thorax. On carefully turning up the lung a large gangrenous abscess, pouring out its contents, came into view ; it had no communication with either right or left bronchus. The left lung was congested ; liver enlarged ; spleen enlarged and softened ; kidneys congested ; several superficial ulcers along the lower end of ilium. No other abnormal appearance was observed.—*December* 1, 1866.

Fibrinous Tumours.—MR. COLLIS exhibited a small tumour which he had assisted Dr. Kidd to remove from the arm of a lady about ten days ago. The tumour was pedunculated, and hung down considerably. The history of the case was simply this :—The tumour had appeared in the cicatrix of an old wound of three or four years standing, whence a tumour, said to have been fatty, had been removed. It had grown to a considerable size, particularly within the last six months, and during this increased rapidity of growth it caused much pain. The tumour presented characteristics sufficiently remarkable to warrant him in bringing it before the Pathological Society. Between the group of fibrous tumours and cancer there lay a class of tumours to which a great variety of names had been given according to the fancy of writers. Many of these names might be discarded, while others might very fairly be retained. Among those which might be retained were the fibro-plastic tumours, which, under the name of myeloid, were known as connected with the periosteum, and also the keloid growth, which was known as the cicatricial tumour. He was disposed to class this tumour, at first, under the keloid variety ; but on closer inspection he found it was not so much on the skin as the keloid tumour, but was beneath the skin, though it presented to the eye the rosy colour and to the touch the firm elastic feel of the keloid tumour. He thought the term fibrinous well applied to this form of tumour. Fibro-plastic might be applied to those connected with the

periosteum, and it might be better not to disturb it from that connexion. He thought it better to give them the name of fibrinous tumours, as this implies their origin from the lymph cells, and is at the same time a term sufficiently comprehensive to include many forms of morbid growth which differ slightly from each other, and to which various names had been given, according with these slight differences.

They found the section of such a tumour to be dry. There was no cream or juice exuding from it as in the scirrhous or cancerous tumour. The substance of it was firm and elastic to the feel, white and shining in its recent condition, with sometimes a rosy tint through it. The convex surface of the section showed the great elasticity of the tumour. They found it composed of fibro-elastic tissue, with a large proportion of fibrine not developed into fibre. The peculiar form of cell, mixed with the fibro-elastic tissue, was in this case of the oat shape, a form shown by Paget to be connected with a tendency to recur; tumours composed almost exclusively of it were known therefore under the name of recurrent tumours. Mr. Collis thought if they were to group all these tumours under one name, and then to indicate the specialties of each tumour, it would be better than having a multiplicity of names which only led to confusion. This special form of tumour was rather rare. They found it generally occurring in connexion with injuries or hurts of the skin, frequently with cicatrices—in this, resembling the keloid, which was essentially in the skin.

He might mention that in order to obviate, if possible, the recurrence of this tumour, they smeared the surface of the wound with a solution of thirty grains to the ounce of chloride of zinc, a mode of treatment of these wounds to which attention had been lately called by Mr. Campbell de Morgan.—*December* 1, 1866

Fracture of the Pelvis.—Dr. QUINLAN brought under the notice of the society a case of extensive fracture of the pelvis, accompanied by diastasis of the symphysis pubis, rendered more remarkable by the fact that, notwithstanding the extent of the osseous lesions, there was no injury of any of the pelvic viscera. He said that the specimen was taken from the body of a female, aged thirty-five, who was, upon the 18th of November, knocked down and run over by a horse, yoked to a heavy country cart, which was, however, empty at the time of the accident. Her symptoms were at first those of collapse; and when reaction had set in it was found that there was a fracture of the ala of the left ilium and a counter-fracture of the right os innominatum; the fracture of the left side being produced by the direct violence of the wheel passing over that side of the body, and that of the right ▮by the pelvis being " stove in " by the agency of the head of the right femur, which, by means of the right great trochanter

resting upon the ground, acted as a wedge. Swelling and œdema of the right thigh and iliac region followed, and ended in a deposition of matter underneath the fascia of the right iliac fossa and down along the sheath of the vessels of the right thigh. There was also a great deal of localized peritonitis in the right iliac region. The patient finally sank, from pelvic cellulitis, upon the eighteenth day.

A *post mortem* examination was made twenty-four hours after death; and upon opening the abdomen there were found, in the right iliac region, a fluctuating swelling, to which the cecum was attached by lymph, the result of the circumscribed peritonitis above alluded to. The cecum was dark-coloured and inflamed, but there was no communication between it and the swelling. Laying open this latter there was found a great deposit of purulent matter, which was traced along the psoas muscle as high as the fourth lumbar vertebra, downwards, half way down the thigh, along the sheath of the vessels, and inwards to a fracture of the os pubis, which will presently be described. This cavity contained, in addition to pus, some aplastic lymph and ecchymosed blood. Along the right ilio-pectineal line there was extensive ecchymosis under the peritoneum, as if the wheel, after leaving the ala of the left ilium, had pressed down upon this part. The bladder, vagina, uterus, rectum, and intestines were carefully investigated, and were found uninjured. Upon examining the osseous structures of the pelvis there was found, in the left os innominatum, a fracture extending from beneath the anterior inferior spinous process to a point about an inch behind the anterior superior spinous process, and breaking the piece off. There was another fracture commencing about an inch in front of the posterior superior spinous process, and running into the left synchondrosis. In the right os innominatum, where the counter-fracture had occurred, there was a longitudinal fracture, commencing at the upper and outer part of the obturator foramen, and extending backwards through the acetabulum and the ala of the ilium to the crest, at a point about two inches in front of the posterior superior spinous process. From the centre of this fracture there was another, extending through the ala of the ilium and the anterior superior spinous process. Turning to the acetabulum, the great longitudinal fracture, already described, was found passing through this cavity in a line slightly above its notch. From this there branched off a fracture of the shell of the acetabulum, running across the whole cavity. The cartilage of the head of the femur opposite these two fractures was eroded; and around the erosis the cartilage was very vascular. In the right pubic ramus there were two fractures, one of the thin portion of the descending ramus a quarter of an inch above the point of fetal union, and the other of the ascending ramus of the ischium where it joins the tuberosity. Lastly, there was a dislocation of the symphysis pubis, the right pubes being dislocated forwards and

slightly upwards, the inter-articular cartilage remaining attached to the left pubes, and having still connected with it a fragment of the right pubic bone. The sacrum and coccyx were uninjured.—*December* 8, 1866.

Cholera.—DR. HAYDEN exhibited some morbid specimens taken from patients who had died of cholera in the Mater Misericordiæ Hospital in the course of the present epidemic. It appeared to him that this subject, which was to a certain extent new to the society, should be illustrated by all the morbid specimens obtainable, and therefore he had thought these worthy of being brought under their notice. The first was taken from the body of a man, aged twenty-six. He was taken ill with all the symptoms of cholera on the morning of the 20th of September. He was admitted two or three hours subsequently, viz., at ten o'clock, in a state of collapse, and on the following morning at two o'clock he died—that is, in nineteen hours after the commencement of the illness. The symptoms which he presented were those of perfect collapse, with all the appearance of typical cholera. A *post mortem* examination was made five hours after death. The body was then much less livid than it was before death; there was no rigor mortis. The sinuses of the dura mater and the cerebral veins were engorged with dark blood. In the cerebral ventricles was found a large quantity of clear serum— indeed, they were distended with it. On making a horizontal section of the hemispheres of the brain a remarkable appearance presented itself; the puncta cruenta were large and numerous, and from each dark fluid blood welled up immediately, and spread over the surrounding surface, so as to form a circular patch of ecchymosis, as large as a three-penny piece, of which the divided vessel formed the centre.

The vessels of the pia mater were somewhat engorged. The lungs were congested; more markedly so on the right side than on the left. The right lung presented a slate-coloured appearance posteriorly and inferiorly, where it was filled with dark blood mixed with serum, but still resonant on percussion and slightly crepitant. The heart was engorged—its right cavities filled with dark blood. In the right ventricle this was enclosed in an envelope of firm yellow fibrine one-eighth of an inch in thickness.

The left auricle was contracted and empty. The left ventricle quite empty, its cavity diminished in size, and its walls greatly thickened. In the abdomen the most remarkable appearances presented themselves. The liver, spleen, and kidneys were perfectly normal. The external surface of the hollow viscera was smooth, white, and glistening, as in a state of health.

The mesenteric glands were considerably enlarged, some of them as large as peas, others the size of duck-shot, but all more or less enlarged. The stomach contained a quantity of gruel-like fluid. The œsophagus,

at its entrance into the stomach, presented a remarkable appearance, the mucous membrane projecting into the stomach, forming a radiated disc with a festooned border, and presenting the appearance of a piece of wet parchment. It was pale in colour, and sodden-looking. Immediately round the cardiac orifice of the stomach the mucous membrane was remarkably mammilated, the crypts distended with an opaque white fluid. The small and large intestines were nearly filled with a fluid very like thin gruel in colour and consistence, and containing small light-coloured flakes floating in it. In the duodenum Brunner's glands were found enlarged and of a light colour. In the jejunum and ileum the glands, both solitary and agminate, were enlarged, and filled to distention with an opaque fluid of the colour of unhealthy pus, and presented the appearance like that of the early stage of small-pox. The surface was remarkably vascular in the jejunum and upper portion of the ileum. The last three inches of the ileum were free from vascularity, and one of Peyer's patches was here found to have discharged its contents, all its glandules being ruptured and collapsed, and presenting a distinct aperture on the surface by which the contents had escaped; the entire surface of this patch, which measured about three inches in length, was depressed below, and contracted markedly with, the surrounding surface on which the solitary glands were prominent and distended. The fluid contents of one of these glandules were examined microscopically, and found to consist of large granule-cells like mucus corpuscles, and amorphous granular matter. The enlarged glands extended quite to the free edge of the ileo-cecal valve.

The next specimen which he exhibited was taken from the body of a boy whose age was six years. He was taken ill at seven o'clock on the morning of the 23rd September, admitted into hospital at ten, and died at three o'clock on the following morning, exactly nineteen hours from the date of first illness, as in the former case. His case was likewise a typical one. He was perfectly livid, had no pulse, vomited, and suffered from violent spasms. A *post mortem* examination was made of this boy's body six hours after death, and as in the former case the lividity was less than before death, and there was no rigor mortis. The cerebral veins and sinuses of the cranium were remarkably distended with dark fluid blood. In the ventricles of the brain he did not find so much serum, but still a few drachms of it. On making a horizontal section of the hemispheres the puncta vasculosa immediately became the centres of large patches of ecchymosis. The choroid plexus was of a slate colour, and deeply congested. The pia mater investing the surface of the brain throughout, but more especially at the base, was congested. The upper portion of the spinal cord was in a similar condition, but its white substance and grey centre were free from vascularity.

The lungs were engorged, but not to the same extent as in the first case; the anterior portions were light in colour, and crepitant.

The heart presented an appearance similar to that observed in the first case. The right cavities engorged with dark treacle-like blood, and as in the first case, in the right ventricle it was enveloped in a capsule of fibrine which extended into the pulmonary artery. The venæ cavæ were likewise engorged with dark blood; left cavities empty, and the left ventricle diminished in capacity and thickened in its walls.

In the abdomen the appearances were similar to those in the first case. The stomach presented a similar condition. The mucous lining of the œsophagus projected into the stomach, and presented the appearance of a wetted bladder or piece of parchment, and around the cardiac orifice the mucous membrane of the stomach exhibited the mammilated condition mentioned in the first case. In the duodenum Brunner's glands were enlarged, and in the jejunum and ileum the glands, both solitary and agminate, were distended and prominent, as previously detailed, and one of Peyer's patches near the cecum had discharged its contents, all its glandules being ruptured and collapsed, while all of those in its neighbourhood were full to distention with a light coloured fluid like gum-water. In the large intestines some vascularity was apparent.

The liver, spleen, and kidneys were in a normal state. He took one of the semilunar ganglia with the great splanchnic nerve connected with it, in order to test a theory which had been advanced in connexion with this disease. According to some paresis of the vaso-motor nerve system would explain most of the symptoms in cholera, and it had been suggested that perhaps congestion, or other abnormal condition of the semilunar ganglia might be found. Nothing of the kind, however, was to be seen in this instance; it will be observed that the ganglia and appended nerve are, to all appearance, in a perfectly healthy condition. (Morbid specimens exhibited).

The third case was that of a boy, aged four, who also died on the 24th September. In most particulars the details resembled those given of the preceding cases. The condition of the brain was similar, as was also the state of the intestines, which were quite full of a light grey viscid fluid, of the colour and consistence of boiled starch; examined under the microscope this was found to consist of columnal epithelium, and its debris with crystals of triple phosphate. The present case presented the best example of the enlargement, and likewise of one of Peyer's patches of the solitary glands in the stage of elimination. The large intestine was injected, as in the first and second case. He had also obtained from the body of a woman who was admitted in a state of collapse, and with complete aphonia, and who died two hours after admission, the larynx and tongue, with a view to determine whether the loss of voice was explained by some physical change in the organ of

voice. He had previously formed the opinion that the loss of voice was due to debility, or inability on the part of the patient to propel the expired air with the requisite force, but on examination he found that the true vocal chords were thickened, their sharp edges rounded off, and the ventricle of the larynx diminished in capacity, by thickening of the mucous membrane; there was, however, no abnormal vascularity of the larynx.

The first point on which he wished to make an observation was the condition of the glandules of the intestines. There was nothing new in the appearance presented by these. Dr. Parkes noticed it in his work on cholera, but he made a statement which appeared to him (Dr. Hayden) not to be justified, viz., that the enlargement of the glands was the result of the diarrhea. He could not agree in this opinion. He was not aware that enlargement of the glands had been the consequence, although frequently it has been the cause of diarrhea in other diseases, and when they found that in the neighbourhood of these glands there was no appearance of vascularity they could not admit Dr. Parkes' view, which would involve the existence of a considerable amount of irritation and vascularity. The mesenteric glands were enlarged in all these cases. They were secreting glands, as were also Brunner's glands, and yet these were quite as much enlarged as the excreting glands, properly so called.

With regard to the alleged lesion of the vaso-motor nerve system, whilst he would not be understood to deny the possible existence of some inappreciable alteration or functional derangement of that system, he did not think it was good philosophy to attribute to a lesion not proven to exist, a set of symptoms that may be explained by organic changes constantly found. If, in addition they assumed, as he thought they were warranted in doing by all the evidence before them, the existence in the blood of a specific morbid poison, they would have in that, taken in connexion with the lesions he had exhibited, a satisfactory explanation, as it seemed to him, of most, if not all, of the symptoms of Asiatic cholera.—*December* 8, 1866.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE COLLEGE OF PHYSICIANS.

Dr. Stokes, President.

Farther Observations on Hydrocephalus, and its Treatment, particularly by the Use of Issues. By Henry Kennedy, A.B., M.B.; one of the Physicians of the Cork-street Hospital, and attached to Sir P. Dun's.

Amongst the diseases of childhood, hydrocephalus occupies a prominent place; and I presume I address few who have not met it, and who will

not acknowledge its great fatality.   Some twenty years ago it seemed to me the most fatal disease seen in early life, and must probably be still so considered.   Yet, as years have rolled on, I have gradually come to modify my opinions materially ; as I now know that a fair share of cases may be saved, even when the disease has passed into the second stage ; that is, when dilatation of the pupils has taken place, and there is every reason to suppose that effusion is present.   It is quite true that there are a number of cases of recovery on record, even from this stage of the disease.   But the most of them all are isolated cases, and many of them published as what might be called curiosities, being recoveries under very hopeless circumstances.   Now, I wish to state here that, with our present knowledge, we may look with confidence to a certain per centage of recoveries, aud what is of still more moment, that these recoveries are directly due to treatment, of which I hope to give sufficient proof before these remarks are concluded.

When I last spoke on this subject before the Obstetrical Society, I entered, at some length, into several points connected with the disease, such as the prognosis, diagnosis, and above all, the natural history of the affection, on a knowledge of which latter so much of the character of the physician depends.   Into these I shall not enter again, and more particularly, as they have already appeared in print.   There is one of them, however, to which I must again advert, I mean in reference to the two forms of the disease which are to be seen in practice.   In the one—and this, probably, the more common form—the disease comes on in the progress of gastric or infantile remittent fever ; or supervenes on an attack of some one of the exanthemata or hooping cough ; or as a disease *sui generis*.   In the second, the disease supervenes on regular typhus ; by which I mean a fever attended with spots.   Now, when hydrocephalus comes on in the course of the former, it is, in my experience, a much more fatal affection than in the latter.   Some gentlemen I know have thought that the disease arising in connexion with typhus fever was not the genuine hydrocephalus.   For myself I must say I cannot distinguish between them ; but, as the point is one of considerable moment, it may be well to bring before the meeting a sketch of a few cases, and in this way the members can judge for themselves.

Case I.—In July, 1855, a boy of ten years of age was admitted into Sir P. Dun's Hospital.   He laboured under typhus fever, and had a copious rash over his body.   He was sent in by Dr. Mecredy.   The patient was quite stupid, and very hard to rouse in any way.   There was a marked frown on his forehead, and any complaint made was of his head. Both pupils were dilated ; the pulse was rapid, the discharges from the bowels blackish, and every now and then he had the cry which so often marks affection of the brain.   This case got well, but his recovery was

of the very slowest, and the dilatation of the pupils was the last sign to give way.

CASE II.—A boy of ten years of age was admitted to hospital labouring under typhus fever, and well spotted. He had also oozing of blood from lips and gums, and was said to be eleven days ill. Two days later, that is, when about thirteen days ill, signs of the brain getting engaged appeared. Severe pain in the head came on, attended by marked screaming, and the pulse, which had been rapid, fell suddenly to 60. The pupils, too, became dilated, though not in a marked degree. It is enough to state that this case also recovered; but that recovery was, as in the last case, very slow, and the pupils remained still dilated, at a time when the patient was otherwise well.

CASE III.—Fitzgerald, a child of seven years of age, was admitted, labouring under fever, of as severe a character as is ever seen in childhood. The tongue was dry as a board, and the lips covered with sordes. There was also tympany, but there were no spots. I could not learn how long he was ill. In a day or two later symptoms of brain affection made their apppearance. The pupils became dilated, one more than the other; sighing also was very marked, and grinding of the teeth, and of such an intensity as made it most painful to hear. Then squinting came on, and finally convulsions, and death.

CASE IV.—Cunningham, a girl of thirteen, admitted labouring under heavy petechial fever. Whilst in this state she got a very severe attack of diarrhea, the discharge being of a light yellow colour, and attended with tympany, and marked pain on pressing the ilio-cecal region. Her lips were covered with sordes, the eyes deeply injected, and her nights very bad. In fact, the case was a good example of typhus and enterric fever conjoined. As the abdominal symptoms subsided the patient began to complain of her head. She got pain in it which she referred to the forehead, and this was attended by a very marked frown, with constant and deep sighing. The next day I found her with her head drawn back, and complaining still more of pain in it; and she was reported to have screamed out frequently during the night. The pulse was now become unequal, the pupils had a tendency to dilate, and the eyelids drooped. The treatment—of which more again—succeeded in removing all these grave symptoms, and the patient made a good recovery.

CASE V.—Burn, a boy of ten years of age, admitted to hospital labouring under fever, of what would be called the gastric type. His tongue was very red at the tip and edges; elsewhere thickly coated with a white fur. The eyes were deeply injected, the cheeks of a very

high colour, and he made great complaint of his head. When about ten days ill, a rash, of an unusually distinct character, appeared on his arms and legs, and, subsequently, on the body. This course of the rash, I may observe in passing, is by no means uncommon, and more particularly in childhood. The spots in this instance were large, well-defined, and of the bright colour so constantly seen in the young. Though the fever declined, and the spots disappeared, the head became worse and worse, and there was every prospect of the case proving fatal; as I had seen in too many instances before. Treatment, however, did ultimately prove successful, and the boy made a good recovery.

CASE VI.—A boy, of eleven years of age—one of four brothers, all in hospital at same time—presented very heavy spotted fever. As it declined, his brain became seriously engaged; so much so that his life was in imminent danger for many days. By treatment which would at present be thought very active, the patient gradually emerged from this state, and he made a good, though a remarkably slow recovery.

Did time permit, I could give a number of other cases where an affection of the brain—as I believe, of the nature of hydrocephalus—exhibited itself; either when typhus, as shown by the presence of spots, was present, or just as the symptoms were on the decline ; or the patient might even be pronounced convalescent. And here I may remark that hydrocephalus does not exhibit that uniformity of symptoms which books would lead one to expect; or at least exceptions are so frequent that we should be prepared for them. Thus I have seen cases, and they were proved by dissection to have been the disease, where there was no vomiting at all, or only at the very commencement of the illness; and, again, I have seen cases where the pulse did not go through the stages which writers have laid down as diagnostic of the affection; and so of other symptoms, as, for instance, the pupils, which may be seen contracted from first to last. The cases given this evening bear out these remarks, and show, as I believe, some of the varieties the disease exhibits; whilst the rate of mortality, which it must have been observed was very low, proves what I stated at first, that the affection of the brain, seen either in conjunction with typhus, or just as it is declining, is not so fatal as when hydrocephalus occurs under other circumstances. It is not my intention this evening, nor would it be suited to the meeting I have now the honour of addressing, to enter into any farther points connected with either the diagnosis or prognosis of the disease. But to some remarks on the treatment I would ask attention ; and, indeed, it was for this special purpose I now appear here.

It is more than a century since the periodicals of the day began to contain scattered cases of hydrocephalus in which recovery occurred under very hopeless circumstances ; the change being due to the

administration of mercury. From that period mercury became the established medicine for the disease, and so continued till about thirty years since, when the discovery of iodine, or rather its preparations, led to the use of the hydriodate of potash, in certain stages of the disease. Still I believe that, with many, mercury continues to hold the first place. For myself I may say, I had seen it very largely used; but with the most indifferent success. A case now and then did recover, and, apparently, from the direct effects of the drug. On the other hand, I have notes, at the time of which I speak, of upwards of twenty cases, in all of which mercury was freely given, and yet not a single recovery occurred. With such an experience as this, it will not be wondered at that some change appeared to be needed; and so when I came to have the treatment of the disease in my own hands mercury was not used as I had seen it given; and at the present time it is only as a purgative I order it, and that within the first three or four days of the attack. In its place I substituted what would be called a diuretic plan of treatment; the medicines consisting chiefly of the preparations of potash, to which, as recommended by the late Dr. Cheyne, the tincture of digitalis was commonly added. By this plan a certain measure of success was attained, and this was still further added to when I came to use the hydriodate of potash. The use of this medicine in hydrocephalus I look upon as a very decided advance in the treatment of the disease. But I do not for a moment claim any originality about it. It was given by others before I had ordered it. All I can do is to add my mite of experience in its favour. When I last spoke on this subject, several cases in which this drug was largely used, and in which recovery, under very hopeless circumstances, took place, were detailed; and before I close these remarks others will be given.

In speaking thus of a particular medicine it must not be supposed that the remedies in more common use are to be neglected. Thus there are very few cases where, within the first week of the attack, leeches are not of essential benefit; and I mention these more particularly because it has become so much the fashion of late to decry anything of what is known as the antiphlogistic treatment. In the present instance experience must overthrow theory, no matter how ingeniously supported, or by whom. And equally so of other remedies of the antiphlogistic class. But granting that all the means now alluded to have been put in full force, are they capable of coping with the disease under consideration? I believe not. All they have effected in my own hands has been to render it somewhat less mortal than previously. More were saved; and some under very hopeless circumstances. Still the fatal cases far, in a way, exceeded those that recovered.

It was while matters were in this state, that is, all the remedies in more common use were administered, together with the hydriodate of

potash, I observed something else was required. I could not help being struck with the fact that some of the cases recovered, as far as the brain symptoms went, but died in the long run either from pure wasting, or from disease set up in the chest or abdomen. With such experience, the idea of giving wine at once presented itself; and this I believe to be a very important step in the treatment. All I address must be aware that hydrocephalus is essentially a constitutional affection, and in the great majority of cases closely allied to the strumous diathesis. Hence the greater need of some such treatment as this. In the various works on the disease, through which I have looked, I do not find any mention of wine; except in West's able work, and then in the most casual manner only. I look upon wine, however, now as very essential; and in all the cases I have hitherto given, which were successful, it formed a very important part of the treatment. It was given as early as the symptoms in each particular case allowed; and largely, considering the age of the patients. Perhaps one case of this kind, and treated as I have detailed, will not be out of place. It has, however, been given before.

CASE VII.—A girl of twelve years of age was admitted into hospital, labouring under a very severe attack of typhus fever, being densely spotted. She was very restless, the brain much engaged, and she rambled constantly, and kept the patients in the same ward disturbed by her cries. This state continued much longer than usual, but finally subsided, and the girl recovered so far as to ask leave to get up. At this period she began to complain of her head, referred to the forehead; with this fever lighted up again, the skin being hot, the tongue furred, and the pulse quick. From this on every symptom of water on the brain developed itself. The pulse passed through all the more regular stages of the disease, even to the third; the pupils became dilated; the girl quite stupid, and apparently stone deaf; the arms were rigid, whilst the peculiar cry of the disease was constant. From this state, which lasted about nine days, the patient gradually emerged, and very interesting it was to observe the daily progress. The dilatation of the pupils was the last symptom to yield, and even when she left hospital they gave the idea of being still very sluggish. The entire period occupied in the second attack was, in this instance, just five weeks. Besides the ordinary treatment, which consisted mainly in repeated leeching and blistering, and the steady use of the hydriodate of potash, this patient got wine from an early period of the attack; eight ounces for some days, and then for a longer period six each day. The case was seen all through by Dr. Grimshaw. Successful, however, as this particular case was, I must add that the same treatment failed me in other cases, where I had every reason to hope it might prove of benefit. I found that in such cases I could better the disease, and the patient expressed as much, but I did not cure it. The improvement,

in fact, was but temporary, and the disease again resumed its sway to a fatal termination. In all of these cases the disease seemed to me prolonged beyond the usual period; though this is not an easy matter to determine; and in some of them it certainly spread from the brain, which was the first part attacked, to the spinal marrow or its coverings; and so became a kind of cerebro-spinal arachnitis. This was shown by stiffness in the neck and arms, and occasionally by opisthotonos; neither of which were present when the attack began. It may be observed, in passing, that this course of the disease is very important to recognize, and one for which we should be prepared. It shows we have a very obstinate affection to contend with. At any rate, some of the cases terminate in this way, while in others it was a recurrence of the disease in the brain, after it had apparently yielded to treatment, which proved fatal. Under these circumstances, it appeared to me that an issue might prove of service. All the ordinary means of counter-irritation, including tartar emetic ointment, had failed again and again, and so some decided measure was needed, if any treatment of this kind was at all to avail. This is not the place to enter into an inquiry of the effects of issues. I believe, at the present day, they are too much overlooked, and that they are a most powerful means of combatting disease admits of no doubt, and more particularly when made of large size. With these feelings I determined, in the next obstinate case I should meet, to insert an issue in the head, and see what the result would be. The following cases are examples where this line of treatment was adopted.

Case VIII.—Gaskin, a girl of ten years of age, admitted into hospital in May, 1866. I was in the ward at the moment she came in, and thought, as she walked towards me, that she was deformed; for her head was drawn forcibly backwards, and severe pain was caused by the slightest attempt to move it. She complained of pain, too, in her head, and said she had been a week ill. There was great distress in her countenance, and a marked frown on her forehead, and the pupils of both eyes were much contracted. With these symptoms there was very high fever and rapid pulse. The patient, I should add, was thin, had a fine skin, and high complexion. Her head was directed to be shaved, six leeches to be applied to the nape of the neck, a turpentine enema to be used, and doses of gray powder, at fixed intervals, to be given. This treatment gave some relief; and two days later, that is, on the 16th of May, she got four grain doses of the hydriodate of potash every three hours; also four ounces of wine. This plan, together with leeches and blisters, afforded marked relief, but only of a temporary kind, for the pain in the head returned, and it was to the forehead all her suffering was, from this time forward, referred. At this period the pupils began to dilate, and there was occasional vomiting. All through the pulse kept

high.   For so far the pain in the head was comparatively bearable.   It became now, however, much more severe.   She would scream with agony, holding her head with both hands, and crying out, " My head, my head." In this dilemma I had recourse to an issue, and a large one was put over the parietal bone, and with a result that was truly marvellous.   From that moment all pain ceased.   The face had, next day, regained its calm expression ; the fever had fallen a little, and she had not vomited.   It is enough to add, that this patient made a steady though slow recovery.

This was the first instance in which I used a large issue, and the result was most striking.   For, that they stood to each other as cause and effect I could not doubt.   Whilst putting in the issue I observed that the scalp all round became very red.   The illness of this patient occupied a period of eight weeks.   The next, though presenting under somewhat different circumstances, was also of much interest.

CASE IX.—Grace, a girl of eleven years of age, admitted in June, 1866.   Not known how long she was ill.   When first seen she was in a state of deep stupor, with both pupils largely dilated, and one eye squinting.   The pulse was unequal and slow, about 60 in the minute. She was quite incapable of putting out her tongue.   Her head was large, or at least appeared so.   She had vomited, and this recurred again in the course of her illness.   After the head was shaved it was leeched, and she got one dose of calomel, to be followed by a turpentine enema.   The next day she was somewhat roused, and when some drink was put to her lips it was clear an effort was made to swallow.   In this state the child was put on hydriodate of potash, four grain doses each four hours ; she was leeched and blistered several times, and was given ℥iv. of wine daily ; and after some days she seemed to be getting on well, when, after an interval of two days, during which she was still more decidedly better, the neck became again rigid, for it had been so before ; pain of a severe kind was complained of in the forehead, the fever increased, and the girl vomited.   In fact, there was a distinct relapse.   I thought well of again applying leeches to the nape, and at once following this up by the insertion of a large issue in the head, and I had now the satisfaction of finding that the disease yielded to the treatment.   It is, however to be particularly observed, that there was no marked remission of the symptoms till the issue began to discharge ; and this was, of course, several days after it was put in.   This girl made a good though tedious recovery.

In this case the recovery was also remarkable ; the more so as the disease was very well marked, and was far on in the second stage when first seen.   It is also well worthy of notice the amendment which took place under the use of wine and hydriodate of potash ; of the relapse which then occurred, and the final recovery of the patient under the use of the issue.   The patient was in hospital from the 22nd of June till the 11th of August, that is seven weeks.

CASE X.—Deegan, a girl of ten, came in labouring under fever of the gastric type, and marked by a very red tongue; there were no spots. After some days the fever got better in every respect.   In this state she began to complain of pain in the forehead; and with this there was a marked increase of fever; the pulse being quickened and unequal; and the tongue furred; the pupils were contracted.   The treatment adopted, which I need not again repeat, had only a temporary effect in subduing the pain, which, after a lull again recurred, and with increasing violence; and finally the patient screamed with the agony, holding her head with her hands, and I need scarcely say disturbing the patients in the ward. At this period, when the girl attempted to sit up, her head shook violently, and quite beyond her control.   I now had recourse to a large issue, placed over the parietal bone; and here, as in the other cases, the relief was very marked.   The patient was quite free of pain for two entire days, when it recurred slightly, and so at intervals for the next week; but never in any degree comparable with what it was before the issue was used.   She did, however, at this time complain of severe pain in the spine, about the tenth dorsal vertebræ.   This is a symptom of grave omen in these cases, as I have too often seen, as showing a tendency in the disease to spread.   It was fortunate, however, that it yielded to some local treatment, and the discharge from the issue being now established she made no further complaint of it.   About a week later her friends removed her from the hospital, against my wishes, for she had been getting half a pint of wine daily for a long period, together with other nourishment, and it was not likely her friends could give her such at home.   I am glad to say, however, that the girl seems now to have quite recovered.   She has left two months, and I have visited her twice, and found a very marked improvement in the interval.   She had been using the cod-liver oil.   It may be well to add that, in this instance, the issue acted a little too deeply; for when the slough came out a small portion of bone was denuded.

The next case presents features of somewhat a different kind; but it is too closely connected with my present subject to be omitted.

CASE XI.—In August last, when I took charge of some of the wards in Sir P. Dun's hospital, a girl of thirteen years of age came under my care.   She had been previously a patient of Dr. Law's, and presented then a well-marked instance of spinal arachnitis.   When I first saw her it was plain the disease was not not entirely conquered.   There was still some fever, with hot skin; furred tongue, and quickened pulse; the child vomited occasionally; and the appetite had not returned.   She was put upon the hydriodate of potash.   After some days no amendment had taken place.   She vomited at regular intervals of about thirty-six hours, and this in spite of anything I could devise to allay it—and a good many

means were tried.   The urine, I should say, was free from albumen. Finally she allowed to having pain in the head, referred to the right side, but I suspect this had gone on for days previously, for I had found her crying on several mornings.   Though temporarily relieved by leeches and blisters, the pain became gradually more severe, and more continuous, and was constantly referred to the same side of the head.   In this state a large issue was put over the right parietal bone; and here, as in some of the other cases, the result was most striking.   The pain and vomiting at once ceased, and never returned, and the child made a very good recovery, and got fat before leaving hospital.

With only one other case will I trouble the meeting at present.   It has been, however, a very striking one, and might be said to be more a case of spinal arachnitis than hydrocephalus.

CASE XII.—On the 15th November last a girl, named Sadler, aged thirteen years, was admitted into the hospital.   At the first glance she had all the look of a patient in typhus fever.   She was covered with spots, and her lips had a quantity of sordes on them; also the tongue. In addition, however, to these symptoms, she lay with her head drawn forcibly backwards, and the nurse stated that when she moved her the whole body was stiff.   All her suffering was at this period referred to her head and nape of the neck.   The skin was very hot; the pupils contracted to a pin's point; whilst the pulse beat but sixty in the minute, and was quite equal in its beats.   The girl had vomited, but there were some doubts as to the duration of the attack; she was certainly eight days ill; most probably longer.   It would be loss of time to give the particulars of treatment; except to say that it was the same as in the other cases, and with like results, that is, temporary benefit; but nothing I could devise succeeded in conquering the pain in the head; referred in this instance to the forehead.   She had also at times severe pains in the spine, and radiating into both the upper and lower extremities.   All through her illness hitherto, that is for a period of twelve days, the pupils kept very much contracted, and the pulse slow.   In this condition a large issue was put in the head; this was on the 27th of November. Though a certain amount of benefit arose from this measure, it was not so marked as in some of the other cases.   The pain recurred several times in the forehead, and more particularly at night; whilst there was occasional vomiting; and these went on till a discharge began to be established, when they at last ceased, and the girl for the last ten days has made a steady, I might almost say, a rapid amendment.   She is still in the hospital, and is getting fat.[a]

[a] This girl left hospital on the 21st of January, 1867, having completely recovered. Her illness occupied nine weeks.

Though five successful cases have been now detailed, the meeting would take up a very erroneous idea if they suppose that all the cases in which issues were used were successful—very much the contrary. It so happened that in May and June of the present year there was what might be almost called an epidemic of affections of the brain of the gravest character. Many of these were sent in at so advanced a stage of the disease that, though issues were used, they proved of no avail, nor any other measure I could devise. From what has been detailed this evening I cannot, however, help thinking that some of these cases would have been saved had they been seen sooner. For I think the cases given by myself prove the very great power possessed by issues; and, whilst I never had occasion to regret their use, I had cases where it was matter of regret they had not been used, or at least at an earlier period. One such occurred in Sir P. Dun's hospital in the end of August. A child of five years old was admitted in the collapse stage of cholera. As it came out of this stage it began to exhibit signs of brain affection; this I at first thought was due to uremic poisoning; but after two days it was clear some other mischief had arisen, for the pupils had dilated, which I had not witnessed where uremia existed. At this time an issue was inserted, but it was too late to save the child. The *post mortem* examination, which was made by Mr. Collins, showed the case was one of hydrocephalus; the morbid appearances being very marked, but confined chiefly to the base of the brain, where the arachnoid was opaque, and had gelatinous effusion under it. In this instance two precious days were lost, owing to the obscurity which hung over the diagnosis. And so of other cases where they were seen too late.

It will have been observed that in the course of these remarks I have spoken of hydrocephalus and arachnitis as if they were one and the same disease, and this was intentionally done. Not that the acute form of arachnitis, whether of the brain or spine, and which prevailed some years since in Dublin, is the same as hydrocephalus, as it is usually met; but that there is a sub-acute form of the same disease which, when it affects the arachnoid of the brain is essentially the disease known as hydrocephalus. In this state there may or may not be effusion of serum; this would usually seem to depend on the duration of the case; but whether there be or not I believe the disease known as hydrocephalus to be essentially a sub-acute inflammation of the arachnoid, occurring very generally in a strumous constitution, and its duration to average from eighteen to twenty-five days. This is the disease about which I have been speaking, and in which I have found issues of such signal use. It is the disease, described by Cheyne, and so many other writers, and which so frequently, but by no means constantly, passed through the three stages they have described.

In conclusion it may be well to state that the issues put in were of

large size, from an inch and a quarter to an inch and a half in length and three quarters of an inch in breadth, and that they were commonly placed over the centre of the parietal bone.   They were put in with potassa fusa cum calce ; but since reading this paper it has struck me that valuable time might be saved if they were put in by incisions.   A purulent discharge would, I should say, by this plan be much more rapidly obtained, and where the case was seen late this would be an object of the greatest importance.

PROCEEDINGS OF THE DUBLIN OBSTETRICAL SOCIETY.[a]

TWENTY-NINTH ANNUAL SESSION.

Dr. Sawyer, President.

ADDRESS OF DR. M‘CLINTOCK, PRESIDENT FOR THE PAST SESSION, ON RESIGNING THE CHAIR.

Gentlemen,—In compliance with the rule of our society, which requires that the outgoing President should inaugurate the incoming session, I most reluctantly appear before you.

Although this by-law may have some advantages, still it has this obvious disadvantage, that it must occasionally expose you to the infliction of a dull or uninstructive discourse ; and such, I fear, will be your lot this evening.

My unwillingness to enter upon this task does not prevent me feeling, however, greatly honoured by so large an attendance of members, and by the presence of so many distinguished guests.   I am especially gratified at seeing around me not a few of our brethren—the pure physicians and surgeons—for it shows that socially, as well as philosophically, midwifery combines the two great branches of which they are distinguished representatives.   Midwifery is, in fact, the offspring of both ; for though medicine may justly claim to be the mother of midwifery, yet the active vivifying influence of surgery was required to make it capable of an independent existence and thorough development.

In the position which, through your goodness, I have the honour to occupy this evening, my first duty is to take a cursory review of the past session ; and this I do with unmixed satisfaction, for I believe that in every point of view it was a remarkably successful one.   The number of meetings exceeded that of any former year, as did also the number of communications, whilst in regard to the variety of subjects brought forward, and the manner in which they were treated, the session was, to say the very least, not inferior to any previous one.

[a] These Reports are furnished by Dr. Geo. H. Kidd, Secretary to the Society.

It would be quite superfluous to attempt an analysis of these contributions, as nearly all of them have appeared in the published reports of the society, and it is to be hoped the remainder will, ere long, be in the hands of the printer. In order to confirm some of the statements just made, it is well, however, just to enumerate the different subjects which have come before the notice of the society during its meetings of the last year. They are as follows:—" Unusual Complication of Labour and Pregnancy" (Dr. Ringland); " Labour with an Unruptured Hymen" (Dr. Denham); " Rupture of the Uterus, and Placenta Previa" (Dr. Isdell); "Laceration of the Vagina" (three papers by Dr. Byrne and Dr. M'Clintock); " Puerperal Fever" (Dr. Telford); " Gynecomazia" (Dr. Foot); " Disease of the Ovaries" (two papers by Dr. Babington and Dr. Telford); " Ovariotomy" (Surgeon Smyly); " Inversion of the Uterus" (Dr. Denham); " Fibrous Tumour of the Uterus" (Dr. Byrne); " Inflammation of Bladder and Vagina" (Dr. Atthill); " Galvanic and other Pessaries" (Dr. Kidd); " An Improved Mode of Preparing Medicated Pessaries" (Dr. Kidd); " The Ophthalmia of New-born Children" (Dr. Wilson); " Double Monstrosity of the Human Fetus" (Dr. M'Clintock).

We have here a good array of work done; and from this enumeration it will be seen that every branch of obstetric medicine—namely, midwifery proper, gynecology, and paidiontology—was brought under the consideration of the society, and gained some addition in the course of the session.

So far, then, as regards the *matter* of our meetings, now as to the mode in which they were conducted. It is generally supposed that our branch of the healing art more than either of the others embraces topics calculated to provoke conflict of opinion and to excite the feelings or prejudices. But the experience of this society gives a flat contradiction to the above supposition, and I am bound to say—and I do it with sincere pleasure—that in no single instance during the past year had the President to exercise his authority in stopping or controlling the discussion which has followed the reading of the various papers brought forward. To maintain such a tone of courtesy and candour is most essential to the well-being—I might almost say the bare existence—of any debating society. In the last public address he ever delivered, Sir Philip Crampton thus alludes to this very point:—" All the dangers, real or supposed, to which debating societies give rise may, I am firmly persuaded, be avoided, not so much by positive restrictions as by the constant infusion, by precept and example, of a conciliatory and gentlemanly spirit. I can conceive no difference of opinion, in a matter of science, to exist between gentlemen, which may not be expressed, not only without offence, but in such a manner as to excite feelings of mutual respect and good will." If there be an offence against good manners (which have

been well described as the lesser morals), an offence more to be deprecated than another, it is what a great moral poet has alluded to as " the poor renown of being smart ":—

> " What though wit tickles, tickling is unsafe,
>   If still 'tis painful, while it makes us laugh ;
>   Who, for the poor renown of being smart,
>   Would leave a sting within a brother's heart ?"
>
>   YOUNG.

In so large a society as this, composed of about the most short-lived class in the community, the retrospect of a year will seldom fail to show some gaps in our ranks, some victims to that insatiate enemy whose coming to all of us we are ready enough to acknowledge, but whose proximity to each of us we are so slow to realize. I am happy to say that our losses have been numerically very small, but amongst them was one of the honorary presidents of the society, a man who for a long series of years enjoyed a very large share of public and professional confidence, and was a worthy cotemporary of the many eminent men who, entering upon practice about the same period, flourished in this city within the last fifty years, and whose names will occupy a foremost place among the most distinguished surgeons and physicians of this metropolis. It is, therefore, not only excusable but proper for me, on an occasion like the present, to lay before you some sketch of his history.

I confess I approach this part of my subject with saddened feelings, for in DR. CHARLES JOHNSON I have lost one of my earliest and best medical friends. Whilst, then, I lament his removal, though in the maturity of years and reputation, I yet gladly avail myself of this fitting opportunity of showing respect for his memory, and my grateful recollections of a friendship existing for more than twenty-five years.

Dr. Johnson was a native of the county Wexford, and entered upon professional life by being apprenticed to Dr. Ebenezer Jacob, the first surgeon of the County Wexford Infirmary (opened in 1769), and upon his death, in 1812, Johnson was transferred to Mr. Thomas Hewson, then junior surgeon to the old Meath Hospital " on the Coombe," where the edifice continues to the present day, but, as you are all aware, has exchanged its surgical for obstetrical fame.

Whilst yet a student Dr. J. had a very narrow escape of his life. I relate the incident here, as it tends to enforce the importance of punctuality, which I always maintain is one of the cardinal virtues, inasmuch as order is Heaven's first law, and there could be no order without punctuality. Johnson was sent by his master, Mr. Hewson, to see a patient residing in Mercer-street. Whilst at the patient's bed-side he found, on looking at his watch, that it wanted five minutes of two, at which hour he was to meet the Treasurer of the College of Surgeons—

Dr. Andrew Johnston[a]—at the Bank, in order to lodge his fees for the diploma; so, leaving the patient, with the assurance of his being back in a few minutes, he hastened to the Bank, despatched his business, and was returning through William-street, when he was met by the astounding intelligence that the house where he had been visiting, and to which he was on his way back, had actually fallen, and in its ruin had killed the unfortunate patient.

In January of the memorable year 1815 Johnson obtained the license of the Royal College of Surgeons, and in three years afterwards he was elected a member of the college. Owing to some defect of vision in one eye, he was advised to take up the obstetric branch of medicine, as seeing was no part of an accoucheur's duty at that day, the uterine speculum being then unknown. Accordingly, in February of the year 1816, he became an assistant to Dr. Labatt, the Master of the Lying-in Hospital.

Dr. Johnson was fortunate enough to gain, about this time, the friend-ship of Dr. John Cheyne, then approaching the zenith of his great and deserved reputation, and holding the offices of Professor of the Practice of Medicine at the College of Surgeons, and Physician to the Meath and to the House of Industry Hospitals. Johnson thereby secured not only a patron, whose influence must have advanced him in practice, but a friend whose honest and sound advice was of the utmost value in guiding him through the difficulties and perplexities which every man has to encounter at the outset of professional life. Dr. Cheyne's acquaintance with Johnson began at the Meath Hospital; and it was observing his steady conduct, and more than ordinary abilities, that induced Cheyne to select him to be his assistant at the House of Industry Hospitals, the onerous duties of which appointment Dr. J. zealously discharged for some years. We cannot doubt but that the medical experience he thus acquired, under so accomplished a physician, and in so large a field of observation, was of infinite service to him, and contributed materially to his great success as a practitioner of midwifery, as well as of physic. The acquaintance thus commenced between these two eminent men gradually ripened into a close friendship that continued up to the lamented death of Cheyne, in January, 1836.

[a] This gentleman was for many years the Treasurer of the Royal College of Surgeons, as also Professor of Materia Medica and Medical Pharmacy (in which chair he was succeeded by the late Mr. Macnamara), and subsequently of Midwifery. In 1794 he got the certificate of the College, qualifying him "to serve as surgeon in any regiment in His Majesty's service." He was appointed surgeon to the 44th Regiment, at Martinique, in 1796. Afterwards he served in the same regiment, in the Egyptian campaign, under Sir Ralph Abercrombie, and received the gold medal of the Sultan. He retired from the army in 1803 (in consequence of ophthalmia contracted in Egypt) and obtained the diploma of the College of Surgeons, licensing him to practise surgery. He died in 1833. For these interesting particulars I am indebted to his son, Dr. George Johnston, of Rutland-square.

Having completed his three years at the Lying-in Hospital, Dr. Johnson took up his residence in South Anne-street, and fairly launched into practice.

Although an interruption to the strict course of the narrative, still I cannot help going over the names of the principal obstetricians of Dublin at that day (forty-seven years ago), the men with whom Dr. Johnson had to compete in the arduous struggle for wealth and fame. The list is pretty extensive, and contains some names that will long be associated with the records of midwifery in this city. First, then, there were two ex-Masters of the Lying-in Hospital, in full practice—namely, Dr. Joseph Clarke and Dr. Thomas Evory, the former in the height of his fame, and still wielding the sceptre of obstetric supremacy with absolute authority, though beginning to contract the circle of a practice that yielded him over £3,000 a-year. Dr. Evory also possessed a large share of public confidence, and, like Clarke, most of his patients were amongst the aristocracy and upper gentry. He was a man in every way calculated to hold a high position in his profession, being not only an experienced accoucheur, but an accomplished physician.

Dr. Labatt, at the time we are speaking of, was near the termination of his mastership of the Lying-in Hospital, with extensive and rapidly-increasing private practice. Dr. John Beatty, though his celebrated paper on the midwifery forceps had not yet appeared, nevertheless was in full business, and reaping a rich harvest as the fruits of his talents and uncommon energy. Dr. Tuke, of Stephen's-green, and Surgeon John Adrien, of Dawson-street, were both in much repute as successful midwifery practitioners, and were largely employed as such by the public of that day.

Besides these prominent men was a number of other able and well-qualified obstetricians, who were all actively engaged in practice—as Dr. Breen, Dr. J. Douglas, Dr. Tom Ferguson, Dr. Pentland (Labatt's successor at the hospital), Dr. Andrew Johnston, the Professor of Midwifery at the College of Surgeons; and Dr. Creighton, his predecessor in the same chair. In addition to these were some others, who had only recently started in the race of competition, but who bid fair, even then, to take a good place—as Dr. Ireland, Dr. M'Keever, Dr. Frizelle, Dr. Shekleton, and Dr. John Peebles—to say nothing of a number of less mark, as Dr. Calonne, Dr. Gilholy, F.C.P.; Dr. Newport, and Dr. Macabe, who nevertheless were well educated and competent practitioners, and each doing a respectable share of midwifery business.

One other accoucheur there was whose name should not be omitted, perhaps, in this enumeration; for, though he was not much to be feared as a rival, yet he was more dreaded by the Doctors than any man in the community, and that was Dr. John Brenan, commonly called Turpentine Brenan, or the wrestling doctor—one of

the strangest compounds that can well be imagined. The history of this man would almost be worth preserving, not merely on account of his trenchant wit and many eccentricities, but as an instance of the power of vilifying in its highest development. There was no degree or species of abuse—satire, ridicule, irony, lampoon, inuendo, taunt, scurrility, or Billingsgate—of which Brenan was not perfect master, and of which, as occasion seemed to require, he did not freely avail himself. He spared neither the physical, moral, or intellectual attributes of those whom he assailed, and the victim of his sallies was most frequently one of his own profession. And yet the *Milesian Magazine*, in which all these specimens of defamatory composition are to be found, and which has scarcely an equal in this style, affords evidence of Brenan's having been a man of strong intellect, keen wit, and classical knowledge.

I am straying too far, however, from my proper subject. We see, then, that at the time alluded to this city could boast of as large a number of well qualified accoucheurs, possessing the confidence of the public, as at any previous or subsequent period. To climb the ladder of fame, and work one's self into first-class practice, with so many able and experienced competitors on every side, most assuredly was no easy matter. And yet, as we know, Johnson did this, and did it, moreover, within a marvellously short interval from the outset of his career.

Of all the men I have enumerated only three survive. Of the rest some have left behind but their name and their example—

<div style="text-align:center">

Nec vixit male, qui natus moriensque fefellit,—

</div>

Others, by their writings, have helped to build up the fame of our national school of midwifery, whilst a few live amongst us in the persons of their sons or grandsons, our worthy friends and *confrères*.

<div style="text-align:center">

" While active sons, with eager flame,
Catch virtue at their father's name,
When full of glory, full of age,
The parent quits this busy stage;
What in the sons we most admire
Calls to new life the honoured sire."
LLOYD.—*Arcadia.*

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Instead of confining himself to pure midwifery, Dr. Johnson early resolved to devote close attention to the study of female and infantile complaints—two classes of cases with respect to which our knowledge was then very scanty and inaccurate. Carrying out this wise resolution, we find him, in the year 1822, associated with the late Sir Henry Marsh (then assistant to Dr. John Crampton at Steevens' Hospital) in establishing " The Pitt-street Institution for Diseases of Children," which, as you are all aware, has existed from that time to the present, and been

productive of much good in various ways. This was, I believe, the first successful attempt in this kingdom to found a special institution for treating the diseases and accidents of early life.[a] That it was a proper and needful innovation is shown, I think, by the fact that special provision now exists for relieving such cases in many of our large hospitals. and there is no doubt this mode of collectively studying infantile, or any other class of complaints, has been of great service in advancing medical knowledge and instructing medical students.

In this same year, 1822, Dr. Johnson published, in the third volume of the *Dublin Hospital Reports*, two cases of extirpation of the inverted uterus. The boldness and the novelty of the practice successfully pursued in these cases, for which there was only one precedent here, and three or four in England,[b] gained him great reputation for skill in the treatment of uterine complaints. From this time forward a large part of his private, and especially of his consultation practice, was made up of these two classes of cases—namely, diseases of women and diseases of children.

Although the paper just alluded to on inversio uteri, and a very admirable one on hooping cough, in *The Cyclopædia of Practical Medicine*, are the only contributions to medical literature that Dr. J. published, still I think we are under some obligation to him for that most excellent and useful manual, *The Dublin Practice of Midwifery*, as the author, Dr. Henry Maunsel, had been an apprentice of Johnson, and, therefore, it is reasonable to suppose, derived his obstetric knowledge from him; at all events the practical teaching of this work was in strict accordance with the views of his master.

Dr. J. was one of those persons who seem to entertain a sort of morbid dread about submitting their opinions or their composition to the ordeal of public criticism. Other instances of this peculiarity in members of our own profession will, no doubt, occur to you; and in Dr. Johnson's case, as well as in theirs, this reticence is just cause for regret, as a man of his vast experience, accurate observation, and matured judgment, could not fail to have added many an instructive page to the didactic literature of medicine. The papers he did publish, as well as his lectures, and indeed everything he wrote, were distinguished for simplicity and clearness of composition. In this respect his style was truly indicated by the legible, smooth, and beautiful execution of his penmanship. Although he was nothing of an extempore speaker, and had done little as an

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[a] In London there existed, prior to this date, at least two institutions where children's cases were especially attended to: these were, the Royal Infirmary for Children and the St. Marylebone General Dispensary.

[b] Dr. Joseph Clarke it was who had previously operated on a case here. Johnson subsequently removed the uterus, for chronic inversion, on four occasions.—*Vide* page 107 of Dr. M'Clintock's *Clinical Memoirs on Diseases of Women.*

author, still, like his namesake, the great lexicographer, he possessed, in an eminent degree, the faculty of expressing himself in the most terse and pithy language, condensing, within the compass of a few words, the keenest sarcasm, the bitterest irony, or the most weighty practical truth.

In 1829 Dr. J. obtained the licence of the King and Queen's College of Physicians, and in 1841 he was elected an honorary fellow. This was a rare distinction, as out of the eighty-two honorary fellows elected since the institution of this order in 1728, not more than five or six were surgeons.

The Professorship of Midwifery in the College of Surgeons having become vacant in the year 1828, Dr. J. applied for it, and was the successful candidate. For nearly ten years previously he had been a member (or, as it is now termed, a " Fellow") of the college, and had served for some time on the Court of Assistants, as well as otherwise taken a part in the administration of the affairs of the college.

Though it may appear somewhat in the light of a digression, still I cannot help taking a retrospective glance at the course pursued by this college in reference to the branch of medicine with which our society specially interests itself. I gladly seize this opportunity of doing so, as I think it redounds to the credit of the Irish College of Surgeons, that from the commencement of its school it made provision for the proper study of midwifery, and that so far back as 1784, the year of its incorporation, it took a just and enlightened view of the importance and dignity of this great department of the healing art. Now, let it be borne in mind that at the period referred to instruction in midwifery was ignored by some medical bodies, and the practice of it regarded as a degradation and positive disability by others.

Among the first professorships created in this college was one of midwifery, according to resolutions adopted in August, 1785. Through want of financial means these resolutions were not carried into effect till 1790, when the school of surgery opened in good earnest, and Mr. John Halahan, the professor of anatomy and physiology, and an ex-assistant of the Lying-in Hospital, began regular courses of lectures upon midwifery in the college school, and continued to do so till 1793, when the college deemed it expedient to appoint a special professor to the chair of midwifery; and for this purpose they selected another ex-assistant of the Lying-in Hospital, Sir Henry Jebb, who was an active member of the college, and subsequently its president. From that time to the present there has been an unbroken succession of obstetric professors and of regular courses of lectures on midwifery in the college school. Sir Henry Jebb was succeeded, in 1795, by Dr. John Creighton, who held the chair till 1818, when Dr. Andrew Johnston, ex-assistant of the Lying-in Hospital, replaced him; and it was on his resignation, in 1828, that Dr. Charles Johnson was appointed, as before stated. He

retained the chair for six years only, as he found that with the immense practice he then had, his health would not be equal to the duties of a professor. Dr. Henry Maunsel, Lecturer on Midwifery in the Park-street School of Medicine, was next appointed, in 1835; and on his retirement, Dr. Beatty, who had succeeded him in Park-street School, was elected, and retained the chair up to 1857, when the vacancy which his resignation caused was filled up by the appointment of Dr. Sawyer.

Dr. Johnson was very successful, both as a medical and obstetrical practitioner. Endowed by nature with an extraordinary amount of sagacity and penetration, he seldom failed to take a clear and comprehensive view of a case. In discriminating between accidental and essential symptoms, and in unravelling the causation of chronic diseases, he often exhibited great acuteness of observation and depth of judgement. He possessed the true *mens medica* in as high degree as any physician I ever was acquainted with. Added to this were the signal advantages arising from study, extensive clinical experience, and habits of careful reflection. He had large confidence in the power of medicinal agents, and as might, therefore, be expected he was most cautious and discriminating in the use of remedies. Hence his prescriptions were admirable, and fully came up to the standard of excellence laid down by that high pharmacological authority, Dr. Paris, who says that the perfection of a medicinal prescription may be defined by three words—*precise* (in its directions), *concise* (in its construction), and *decisive* (in its operation); and such were Dr. Johnson's prescriptions, with the additional recommendation (not always observed by prescribers) of being most legibly written.

He exercised very absolute authority over his patients, and was extremely jealous of any interference with his management; and very impatient—sometimes even to bluntness—when suggestions on the subject of treatment or diagnosis were offered by well-meaning friends about the invalid.

From his first starting in practice Johnson was most particular in the selection of his nursetenders, and would not permit his patients to employ any he did not himself approve of. This was then rather a novel course to adopt, and was often stoutly opposed by the ladies, who considered they ought to have as full liberty in the choice of their monthly nurse as of any domestic servant. But Johnson steadily adhered to the rule he had laid down. By so doing he was able to keep a very wholesome and needful check over this class of medical subordinates; and we accoucheurs of the present day are much indebted to him for possessing an undisputed right of nominating the nurse, without which we should have no real control or authority over her or the patient.

That Dr. J. attained the highest rank in this city as an obstetrician is probably known to most of those whom I have the honour of addressing; and yet all through ife he had to contend with a delicate constitution.

He was frequently obliged, from illness, to give up practice for a time, and to recruit his health by rest or travelling. Nevertheless, such was the amount of confidence placed in him by the public, that these interruptions never seemed to entail any permanent loss in his practice, for no sooner did he return home than his patients all came back to him—a constancy on the part of the public that few medical men can boast of.

Another remarkable circumstance in his medical history was the extraordinary rapidity with which he got into large and remunerative business. At the age of thirty, which was about five or six years after leaving the Rotunda, his professional engagements were very extensive, and what is more remarkable, were chiefly among the upper classes of society.

Although he always showed a prudent deference to public opinion with respect to those matters relating to dress, manner, outward appearance, &c., unimportant in themselves, yet regarded by the public as reliable indications of a man's character and capacity; still, his was not by any means an abject, fawning, subserviency. The hair-powder, inexpressibles, and long boots in which the leading obstetricians figured half a century ago he never adopted, and he was the first accoucheur to relieve us from the *chokedom* of white cravats, by demonstrating in his own person that a black silk tie was quite compatible with the highest obstetric attainments. Such was his independence of mind and self-reliance that he thoroughly despised all the indirect expedients for puffing (as it is called), and he held in just abhorrence every means of obtaining reputation or practice but such as accorded with the honour of his profession, and with a high standard of the *amour propre*. In this point of view the career of Dr. Johnson is instructive and well deserving of our approval; for though there may have been a mixture of pride in the resolution to acquire fame without fictitious assistance of any kind, nevertheless it is a commendable species of pride, and we must admire the man for the constancy and the success with which he carried out his determination, and earned character and wealth by toiling up the arduous road of patient industry, well-directed application, and strictly honourable conduct towards his brethren. After all, gentlemen, I believe this is the only secure basis on which to build a permanent reputation in medicine or any other scientific pursuit.

Of Dr. J.'s merits as a midwifery practitioner I had large opportunities of judging, having been under him in the Lying-in Hospital for upwards of four years, and having frequently met him in private practice. He held in reverence the maxim that " meddlesome midwifery is bad," and certainly he was much opposed to the early employment of instruments. Though entertaining a somewhat exaggerated idea of the dangers of the midwifery forceps, still he was otherwise free from any prejudice against

the instrument ; and this, it must be admitted, showed no small independence of mind, considering his early training, and the obstetric teacher under whom he was brought up. He was wont to say that "it was one thing to be able, *quoad* the case, to use the forceps, but quite another thing to have justification for its use."

What to consider as justification for its employment in tedious labours is a question which has divided the obstetric body into two great sections. The more modern and larger party hold that the instrument should be used in *anticipation* of the ill effects which delay may give rise to. The other great section—which includes the names of Collins and Robert Lee—consider that we should not resort to the use of the iron hand (as the forceps has been well called) till the failure of the natural powers is unequivocally demonstrated. This latter view was held by Johnson, but in a very qualified manner only, for he sanctioned (as Dr. Hardy's and my Report amply proves) a much more frequent employment of the forceps than would accord with the principles of either of the great authorities I have named.

Though myself an advocate for the employment of this "noble instrument" (to use Chapman's designation of it) as a prophylactic measure, still my experience of a clinical obstetric school would incline me to put up this motto conspicuously in every ward of a lying-in hospital frequented by pupils, "Meddlesome midwifery is bad;" and those who have had a like experience will, I doubt not, see the reason for this, and admit its necessity. Johnson's great forte was in puerperal diseases. Here his skill in diagnosis and his accuracy of prognosis were unsurpassed. His opinion in such cases was truly valuable, and that it carried great weight was fully shown by the large number of puerperal cases he was asked to see in the course of his consultation practice.

In November, 1840, Dr. Johnson was unanimously elected Master of the Lying-in Hospital, in which place and year my acquaintance with him commenced, and continued uninterruptedly to his death, on the 19th June last. From him was derived nearly all my obstetric knowledge : his advice often guided me in times of doubt and difficulty, and his kindly interest in my personal welfare seldom failed to inspire me with fresh courage and hope when cast down or despondent.

An experienced and faithful friend at the outset of life is of inestimable value. Such was Dr. Charles Johnson to me, and therefore he must ever hold an honoured place in my remembrance.

> "My thoughts are with the dead; with them
>   I live in long-past years,
>   Their virtues love, their faults condemn,
>   Partake their hopes and fears ;
>   And from their lessons seek and find
>   Instruction with an humble mind."
>
>   Southey.

Gentlemen, I fear I have occupied you a long time with the retrospective portion of this address. I do not offer any apology, however, as I cannot see how it could well have been otherwise.

Of the present condition and prospects of our society there is no need for my saying much, as you have already heard the Council's report, which, though dry in manner, as such a document should be, yet must gratify us all, inasmuch as the statements it contains furnish the best evidence of the continued prosperity of the society and of the increasing estimation in which it is held by the profession at large.

The *renaissance* of our society, in 1862, not only marks an important epoch in its history, when its constitution underwent a complete remodelling, but it was the commencement of a new era in which the society has displayed a vitality, an energy, and a growth that have exceeded the expectations of its warmest friends.

When, at the opening of the twenty-fifth session, in November, 1861, I ventured to suggest that some alterations had become necessary in the by-laws, and that the whole code should undergo a careful revision, I candidly avow to you I did not at all anticipate what great and beneficial changes were to arise from the movement thus initiated. At the good results attending this reconstruction of the society, perhaps nobody—one alone excepted—could experience more thorough and hearty satisfaction than I have done. You will forestall me when I say that the exception just alluded to can be no other than the distinguished founder, Dr. Evory Kennedy. Had the creation of this society—which was the original of all the societies, having the same objects in view—been the only public act of his professional life, and were there no other grounds on which to rest his claims to celebrity, he would still have justly earned a high position among the benefactors of our art.

This society has done immense service during the twenty-eight years of its existence. It has kindled a spirit of honourable emulation amongst us. It has stimulated our industry, has united us more closely in the bond of professional brotherhood, and has been the means of drawing forth many admirable contributions to obstetric science which otherwise would never have seen the light. I feel that our national character as an independent school of midwifery has become identified with it, so that henceforth this society will be regarded as the gauge or index of our earnestness and activity in the cultivation of obstetrics.

The few moments longer that I can hope to keep your attention I would wish to occupy with some general observations upon the subject of *uterine therapeutics.*

The advance in our knowledge of gynecology within the last thirty-five years is, I believe, unexampled in any former age, or in any other branch of the healing art. This extraordinary development has resulted partly from a closer study of pathology, but mainly, I would say, from

improvements in our means of diagnosis, more particularly by the acqui-
sition of the vaginal speculum and of the uterine sound. An additional
sense was thus brought to our aid in the investigation of uterine disease,
whilst the range of another sense was materially extended.

Hence it is not at all surprising that the diagnosis of every uterine
lesion should now be made to rest nearly altogether on objective
phenomena. One of the latest writers upon uterine diseases thus
expresses himself on this point:—" Of all organs the uterus is now most
subservient to the laws of *physical exploration;* and in every case of
diseased action, if we cannot map out accurately the peculiar condition of
the uterus producing or accompanying it, it is simply because we do not
apply our *knowledge of those physical laws* to its investigation."—(Sims, p.
144.)

Now, this habitual reliance on physical signs in the forming of our
diagnosis, together with the modern discovery of the frequent existence
of misplacements of the uterus, and an exaggerated etiological impor-
tance attached to these misplacements, are so many circumstances which,
in my humble judgment, have tended to impart too much of a mechanical
or physical character to the prevailing views of uterine pathology and to
the principles of treating many uterine diseases.

It is matter of notoriety that with a large number of gynecologists on
the other side of the Channel, remedies of a purely mechanical nature
seem at the present day to find most favour. The agencies chiefly relied
on by them for producing a sanative effect upon the uterus, are such as
exert a *direct physical* influence, and are selected with this very intention.

Is it not on this ground, and none other, that incision of the cervix
uteri is so frequently had recourse to for dysmenorrhœa and sterility,
being employed by some practitioners with a frequency that is perfectly
astonishing, and also with an occasional fatality that is not at all
astonishing. " The whole philosophy of this operation (writes one of its
ablest advocates) consists in opening the canal, and keeping it open, so as
to allow the easy passage of the menstrual flow." He is speaking, you
perceive, of dysmenorrhœa, of which he tells us in another page that " it
is only a symptom of disease, which may be inflammation of the cervical
mucous membrane, retroflexion, anteflexion, fibroid tumour in one wall of
the uterus or the other, contraction of the os internum or os externum,
flexures of the canal of the cervix, either acute or gently curved, either at
the os internum, at the insertion of the vagina, or extending through the
whole length of the canal, all of which are but so many *mechanical causes of
obstruction*, which must be recognized and remedied if we expect to cure the
dysmenorrhœa"—(Sims, p. 143). And again :—" I am fully of the opinion
that it (dysmenorrhœa) is simply a sign or symptom of disease to be found
in some abnormal organic condition. This may be inflammation, or it
may be the cause of inflammation, or it may exist without it. But

whether inflammatory or not, its *action is mechanical.* I lay it down as an axiom that there can be no dysmenorrhœa, properly speaking, if the canal of the neck of the womb be straight and large enough to permit the free passage of the menstrual blood—in other words, that there must be some *mechanical obstacle* to the egress of the flow "—(p. 142).

But to resume. In the innumerable contrivances for supporting the uterus and correcting curvatures, deviations, flexions, and versions of this organ, do we not see a mechanical theory predominating above every other?

" An undue development of this mechanical tendency," observes Dr. Tilt, " gave rise to a system of uterine orthopedics, in which the incontestable symptoms of inflammation of the womb were accounted for by its displacements."—(*Uterine Therapeutics,* p. 169).

But perhaps the most convincing proof (though a melancholy one) of the supremacy of these intro-mechanical ideas is to be found in the keen rivalry—even among men of real ability and deserved eminence—about the priority of invention of some apparatus for dilating, or cutting, or stretching, or rectifying the uterus, or such like purpose.

If the reproductive organs of the female be governed by no other laws than those which regulate the movements of a piece of machinery, we *should* concentrate all our attention on the improvements of our mechanical appliances, and attach the highest importance to them.

But, gentlemen, I need not remind you that in addition, but superior to physical and chemical laws, are the vital laws which exercise their influence as certainly, as powerfully, and as constantly upon the sexual organs in health and disease as on any other part of the living organism.

I repeat, then, that in the etiology of uterine diseases, and in the search after remedies, the minds of many able and zealous modern enquirers seem to have taken too much of a mechanical direction. They have evidently fallen into the great error of the iatro-mathematical school, in ignoring or not sufficiently recognizing the dynamic, vital properties, and conditions of the organs concerned.

Whilst pressing this charge I freely acknowledge that some progress has been made in gynecology under the influence of doctrines which are now, as appears to me, being pushed to an unphysiological extent. In the same manner, Borelli and the iatro-mechanists of the seventeenth century may be said to have rendered some service to physicians and the general advance of medicine, though by over-estimating the importance of their doctrines they committed a grievous error, and justly incurred the charge of medical heresy.[a]

[a] The above remarks, just as they now appear, were written some months ago. Within the last few days my attention has been directed, for the first time, to a paper, by Dr. Tilt, on Extreme Surgical Tendencies of Uterine Pathologists, and on The Division of the Cervix Uteri, read before the London Obstetrical Society. I am glad to see that my opinions are, to a great extent, shared in by him and other gynecologists of great ability and large experience. *Magna est veritas.*

In medicine, then, as well as in other important matters, we have need to keep in mind the maxim of the Roman satirist—

> " Est modus in rebus, sunt certi denique fines,
> Quos ultra citraque nequit consistere rectum."

With regard to the employment by the physician of mechanical agencies, a wide distinction must be drawn between diagnosis and therapeia.

For the purposes of diagnosis, I believe we can hardly over-estimate the importance of physical means, as with their assistance we can give more certainty to the evidence of our senses, and multiply the data whereon to base our conclusions.

But in the matter of therapeutics the case is quite different. Here the recognition of vital properties and physiological laws should teach us that all remedial measures whose action is plainly mechanical, and which are, therefore, incapable of affecting the vital condition of the organs concerned, must necessarily have a very circumscribed range of utility.—*10th November*, 1866.

Mr. COLLIS read a paper *On Hare-lip.*

DR. ATTHILL read a paper *On Intra-uterine Polypi*, and exhibited *A New Form of Ecraseur* (see p. 60).—*December 8th*, 1866.

On Rigid Perineum. By Dr. BEATTY.

The management of the last part of the second stage of labour is often attended with difficulties that demand the utmost care, and are productive of serious anxieties in the mind of the individual charged with the conduct of the case. This remark applies more particularly to the phenomena of parturition in primpara; though at times circumstances of a similar nature are found to create embarrassment in those who have already borne a child at the full period.

All persons who have been any time engaged in the practice of midwifery are well acquainted with the tantalyzing torments of a rigid perineum. Hour after hour the attendant sits by the bedside; every pain distending the soft parts seems destined to be the last; the structures, strained to the utmost, seem incapable of further resistance, yet they do resist, until finally a rent at the fourchette takes place, most commonly to a small extent, sometimes to a more considerable one, and the head of the child escapes from the pelvis. In many cases of moderate rigidity, the delivery is accomplished without any rent; but in the more obstinate cases, the greatest amount of care, exercised by the most skilful hand, will fail to prevent some amount of laceration. A knowledge of this fact should lead us to be very cautious in dealing with the reputation of the attendant who has had the misfortune of having such a case under his charge. Every man in practice is likely to encounter such cases, and in some of them no man can prevent the accident. In speaking of this subject, Dr. Denman makes the following remarks:—

"That some degree of laceration should sometimes occur will not be surprising, if we consider the great change and violence which all those parts sustain at the time when the head of the child is passing through them, or that when a laceration begins it should extend through a part rendered at that time extremely thin, and suffering an equal degree of force. When the perineum is indisposed to distend, or if when distended it cannot permit the head of the child to pass with facility, the anterior part of the rectum is dragged out, and gives to the perineum a temporary elongation. The true perineum, and the temporary, as it may be called, thus forming an equal uninterrupted space; if a laceration should commence at any part it might, without the greatest care, extend through the whole.

"That kind of laceration of the perineum which commences at the anterior edge, and runs obliquely or directly backwards, is alluded to in every dissertation on this subject. But there have been many instances of another kind of laceration, which may be called a bursting or perforation of the perineum at that part which is connected with the circumference of the anus, when the anterior part is preserved, and through such perforation, it is said, children have been sometimes expelled."

A remarkable case of this kind occurred in the practice of the late Dr. Beatty, in the year 1808, from whose case book I now quote it :—"October 17th, 1808. I saw this patient in labour with her first child, about seven o'clock in the evening, after having had slight pains during the day with very little effect on the os uteri. I saw her again $10\frac{1}{2}$ p.m., when the progress of labour appeared to be slow. While I remained with her the pains became more frequent, and in a very short time the head rested on the perineum ; but what appeared strange to me was, that though the pains continued to be very severe, and the tumour caused by the head distending the perineum to increase, there was not the slightest dilatation of the os externum beyond its original size. In about an hour the head of the child was entirely expelled from the bony pelvis, and the external parts formed a bag or cap for it, which was forcibly distended at every pain. My fears of a laceration now increased so much that I thought it necessary to explain them to an intelligent woman who was with us, and to make her examine the parts, that she might be convinced of the impossibility of preventing it ; at the same time I used lubricants to satisfy the friends that I would do everything in my power for my patient. At length I found the perineum begin to chip or crack at the prominent part, and soon after give way to such an extent that the child was passed through the aperture, though it did not communicate with the os externum. The placenta was delivered through the same passage ; and when I told the lady that she had had the most painful labour I had ever met with, she said she expected such, from a contraction which had taken place in those parts when she was young, after a fever, a contraction which had almost prohibited coition.

"The os externum had left an oval mark on the child's head, which I

measured, and found to be 2½ by 1¾ inches, and which was the full extent to which the vulva would yield.

"October 28th—this day examined the state of the parts, and found both the sphincters of vagina and anus entire and undisturbed, and the rectum uninjured. The patient was able to walk a little through her room. The wound was in a healthy state, and likely to heal."

But such an accident as this is not the worst that occurs under similar circumstances. A more frequent result is the extension of the rent, commencing in the middle and most prominent part of the distended perineum, and its prolongation through the sphincter ani behind, and the vulva before, thus throwing the two passages into one, and entailing the misery of uncontrolled defecation upon the unfortunate patient.

As I have already said, no amount of the most careful attention on the part of the medical attendant can prevent some of these extensive lacerations at times. The split will begin either in front, and run back to the anus or into it; or it may begin in the middle and embrace both sphincters before it stops; or the head may come through the rent in the middle, and leave both sphincters untorn. In whichever of these ways the struggle terminates the result is very calamitous, and entails a vast amount of suffering on the patient and of trouble to the attendant in whose hands the accident has occurred, to whom the patient and her friends will attribute all the blame. These cases are, in the present day, not so lamentable as they were formerly, for plastic surgery and wire sutures enable us now to remedy the evils in a manner that would astonish our forefathers. I look back with regret to the case of a most interesting, very handsome patient, twenty-five years of age, the wife of a cavalry officer, that passed through my hands thirty years ago. I was engaged to attend her with her second child, and when her labour began I was surprised to find the perineum split into the rectum. I learned that this had happened in her first confinement, which took place before she came to this country, and, as usual, the strongest invectives were heaped upon the head of the unfortunate doctor who had attended her. Her second labour, I need not say, was easy enough, and I saw her for a long time after her recovery. But her life was miserable; she could not venture into society, for she was unable to control the passage of feces or of flatus from the bowels, and she never knew when one or other would escape. If I then knew and could have done what I now know and can do, I would have been able to restore that young creature to health and comfort, and to that position in society which she was intended to adorn. I think it is extremely probable that cases like this are more numerous than is generally believed. Until very recently, it was too well-known that nothing could be done to relieve them, and unfortunate sufferers bore their misery in silence, not wishing, naturally enough, to make known their infirmity when of such a disgusting and

incurable nature.   Since the means of remedying the evil have been devised and successfully practised, the number of cases that seek relief has wonderfully increased ; and in the last edition of Mr. Baker Brown's work on the surgical diseases of women, he gives the details of no less than 112 cases in which he has operated.   When such a vast number has fallen to the lot of one surgeon, we may have some idea of the multitude that must be scattered over the empire.

Seeing, then, that extensive laceration of the perineum is of sufficiently frequent occurrence to arrest the attention ; and knowing, as we do, that at times the most skilful care, as at present practised, is impotent to avert the calamity, it behoves us to enquire more particularly into the nature of such cases, and ascertain the cause of the accident, with the view of discovering some means of preventing it, more effectual than those in ordinary use.   When we look back on our own experience, and read the accounts of such cases in authors who have treated the subject, we find that the conditions of the parts for some time preceding the rupture is as follows :—The head of the child has escaped from all bony resistance, and is well out of the pelvis, carrying the perineum and anterior wall of the rectum before it, these parts forming a cap or bag in which the head lies.   The vulva, however, remains undilated, the efforts of the uterus seem unavailing to cause any extension of that opening, and the head, which in the earlier stage of this part of the process had been driven against it, has now, by the yielding of the perineum, sunk below its level ; and every pain drives it lower, so that all the force is expended in an endeavour to tear through the bag in which the head is embraced.   The soft parts finally give way, often in the middle, most prominent part, and the rupture is effected.   The term, rigid perineum is, in fact, hardly applicable to these cases ; it is the vulva that is rigid, and its resistance that causes the mischief.   It is unyielding of the vulva that is the immediate cause of the danger.

Let us now turn to nature's book, and enquire what means she adopts to escape from the difficulty in cases somewhat less exaggerated than those I have just described.   In minor degrees of rigid vulva the head is enabled to take a more forward course, a greater amount of it is permitted to emerge at each pain, but the tissues will not or cannot yield sufficiently to permit the head to pass through ; the opening must be enlarged before delivery takes place, and accordingly in a vast number of such cases, it is notorious that some fibres of the fourchette give way, and immediately the head is expelled.   A gread deal may be done by carefully supporting the perineum to prevent this rent going too far, but no amount of care will prevent some laceration in many of these cases. Nature I believe to be a very good doctor, and often accomplishes her ends better than the best of us, and moreover, often points out to us the right way to help her out of difficulties, if we study her proceedings, and are not too proud or too timid to imitate her.

The following case will show what can be done by taking nature for a guide :—

On the 14th of November, 1866, a remarkably fine, well-made lady, twenty-five years of age, and just nine months married, took labour at 2 o'clock, a.m. I was sent for, and saw her at 8 o'clock, a.m., at which time the head of the child was well down through the pelvis and nearly rested on the perineum. The head was covered by the still undilated uterus, the os uteri being the size of a two-shilling piece. The vulva was very small, but did not then seem rigid. The pains were natural, the os slowly dilated under their influence, and in another hour, at 9 a.m., it was fully open, and the head distended the perineum at every pain. I looked forward to a speedy delivery, and took my place by the bedside. The head came lower and lower, pushing the distended perineum before it, and at each pain a small portion of a very hairy scalp was protruded through the vulva. In this position I remained from 9 a.m. to 2 o'clock p.m., just five hours, during which time the pains were increasing and more violent, distending the perineum to a frightful extent. I wished to give her chloroform, but she refused to have it. The perineum seemed like a bag into which the head was driven with every intention to tear through it. The soft parts over the head from the edge of the anus to the fourchette, measured nearly $3\frac{1}{2}$ inches; the anus was distended at every pain, showing fully an inch and half of the interior of the rectum. During the whole of this time there was no further dilatation of the vulva, and no advance of the head forwards ; the whole force of the uterus seemed to be directed towards driving the head either through the perineum or through the rectum. It became quite manifest that one or other of these must occur, for there did not appear to be the least chance of the head escaping through the vulva. When matters were in this state at the end of five hours most desperate struggle, I argued with myself, that if nature so often puts an end to such difficulty by the yielding of the fourchette and anterior fibres of the perineum, the best way to rescue my patient from the frightful laceration that was so impending would be to imitate nature, and enlarge the opening of the vulva. Accordingly, seizing the moment when a furious pain, that almost drove the head through everything had subsided, I introduced one blade of a probe-pointed scissors between the perineum and the head, and divided an inch of the soft parts. The very next pain passed the head out through the vulva with the greatest ease, without a single fibre being torn, or the slightest extension of the opening I had made. The recovery was perfect. No treatment beyond ordinary washing was adopted, for the wound, which healed spontaneously, so that the nurse in attendance remarked to me some days after, that I ought to have taken measures to prevent it healing so well, for there would be the same trouble at her next labour. By this simple imitation of what nature so often does I terminated a most difficult and perilous labour

without the slightest ill result to the patient. I find, in two recent authors, allusions to an operation similar to that which I have just described. Doctor Hall Davis, in his very excellent work,[a] says :— " In organic or structural rigidities due to hard cicatrices from former sloughings, sometimes depending upon plastic operations extended too far forward to admit of the exit of the head, these means (chloroform, warm fomentations, unctuous applications, and warm water enemata) may fail. In two cases, last year under my care, such cicatrices were the obstacles, and not yielding to chloroform, in one a rent was inevitable, which, however, left an adequate perineum behind. In the other case, rupture being expected every moment, I summoned the surgeon who had operated, and suggested his making a slight bilateral incision downwards, and outwards to the extent of a quarter of an inch. This sufficed, and the child, living, immediately passed out without any extension of the incisions, which had healed in two days afterwards ; thus the perineum was saved." In the last edition of the highly valuable work of Mr. Baker Brown,[b] he observes :—" In cases where rupture seems inevitable during delivery, Dr. Blundell recommended and practised the plan of relieving the tension of the perineum by a slight lateral or oblique incision during a pain, thus actually producing a laceration, but one of no moment, if it serve as intended, to prevent the tear along the median line, where it naturally takes place, and proves of serious consequence. This plan I concur with, and would practise when chloroform failed or could not be administered. MM. Paul Dubois and Chailly-Honoré advocate. an oblique incision of the vulva towards the perineum about a third of an inch long, either to prevent altogether the rupture of that region when much distended, or when the laceration is unavoidable, to favour it at a spot where it may produce the least mischief. The writers support their views by the history of successful cases." Since reading the above quotation I have searched through Dr. Blundell's work, and not finding any allusions to the operation in question, I inquired from Mr. Baker Brown, and he has kindly informed me, that he attended Dr. Blundell's lectures, and heard him advocate the proceeding.

I am quite sure that none of the members of the society will imagine that I undervalue the well-known means so advantageously employed to induce relaxation of the perineum and vulva, such as bleeding, antimony, chloroform, warm fomentations, and lubricants, or the protection to be obtained by careful support of the perineum ; my object in this communication is to impress upon them, that in extreme cases, such as I have described, after all ordinary means have failed, and frightful injury is impending, a simple operation in imitation of what nature does will avert the danger, and place the patient and her offspring in safety.—*12th January*, 1867.

[a] Parturition and its Difficulties.—P. 13. 1865.
[b] Surgical Diseases of Women. 1866. P. 10.

On Cephalotripsy. By Dr. Kidd.

Cephalotripsy, or the breaking down of the bones of the head, previous to extracting it from a narrow pelvis, is spoken of in German, French, and American works on midwifery, as an operation of the greatest usefulness and highest importance, an improvement, in fact, in scientific obstetrics only second in value to the introduction of the forceps, yet in our standard English works it is ignored entirely, or spoken of as an operation that could not, and has not, been attempted in this country. This repudiation of the operation may be traced to two causes—the formidable appearance of the instrument first recommended for its performance; and the mistaken idea that it should serve as a substitute for perforation of the head and evacuation of its contents, instead of these being essential stages in the operation.

We are indebted to Sir James Simpson for a great improvement in the construction of the instrument; and though he has not published any account of it, so far as I am aware, I know from personal communication that he uses it in all the suitable cases he meets with, and that it is daily growing more and more in favour with him. It appears also from the records of the London Obstetrical Society that Braxton Hicks, Greenhalgh, Graily Hewitt, and others, are beginning to adopt it in their practice. I have myself had Sir James Simpson's cephalotribe for some time, and used it in such cases as required it, and am convinced of the correctness of the principle on which the modern operation of cephalotripsy is founded, and of the suitableness of the instrument we now possess for its performance, and I bring the subject before the Obstetrical Society because I think it full time that the merits of the operation should be fully discussed in a society that so fairly represents the Irish school of midwifery.

The earliest cephalotribe known to us was invented by Assalini, and described in a work published at Milan in 1811; but till Baudelocque, nephew of the celebrated accoucheur of the same name, invented his instrument in 1833, the operation of cephalotripsy seems to have been but little practised. Since then the value attached to the suggestion has been evidenced by the very many attempts to improve the instrument. At the Exhibition of the London Obstetrical Society last year the following seventeen different forms of it were exhibited, besides three varieties of chain-saw forceps, an instrument that may fairly be classed with it; and Hodge's, and probable other forms were not represented:—Assalini, of Milan; Lazarewitch, of Charkoff; Baudelocque, Paris; Baudelocque, by Luer; Depaul, Paris; Depaul, by Charrière; Etlinger and Hugenberger, St. Petersburg; Martin, Berlin; Braun, Vienna; Nyrop, Copenhagen; Cohen, Hamburg; Rizzoli, Bologna; Hennig, Leipzig; Scanzoni, Würzburg; Killian, Bonn; Sir James Simpson, Edinburgh; Schöller.

And of chain saw forceps:—Van Huevel, Brussels; Faye and Mette, Christiania ; Lazatti Milan.

The accouchers of repute who have advocated the use of the instrument are very numerous. I may mention Chailly, Cazeaux, Dubois, Leynseele, Scanzoni, Killian, Crédé, Kiwisch, Hodge, Bedford, and Pajot. Chailly says it has completely banished from obstetric practice crotchets and craniotomy forceps, and all such hooks and pincers. Dr. Hodge, Emeritus Professor of Obstetrics in the University of Pennsylvania, in his great quarto volume on the principles and practice of obstetrics, describes the introduction of the cephalotribe as an improvement in scientific obstetrics only second in importance to that of the forceps. In speaking of the dangers of craniotomy, he says :—

"The slightest consideration of the *modus operandi* of crochets, pincers, craniotomy forceps, and other varieties of tractors, demonstrates that they act not directly, but indirectly, in accomplishing the diminution of the head of the child, so that it may pass through the contracted passages. The head is in reality lessened—not by the tractors, but by the bones and soft tissues of the mother ; for it is dragged through, for example, the superior strait of the pelvis, and this is the real agent which diminishes the head. The bony strait is covered by delicate and important tissues, such as the edges of the uterus, the vagina, bladder, &c. Hence such tissues are powerfully compressed between the bones on one side, and the head upon the other, greatly endangering their integrity and safety. The greater, therefore, the contraction the greater will be the risk to the tissues. No wonder then that there is danger of contusion, laceration, inflammation, ulceration, and mortification of these tissues in bad craniotomy cases. Hence accoucheurs have always dreaded craniotomy operations in confined pelves, as they have too often proved fatal, not only to the integrity of the bladder, rectum, and other tissues of the pelvis, but also to the life of the mother."

The principle of cephalotripsy, according to Dr. Hodge, is that the head of the child should be reduced in size, by compressors, and not by the tissues of the parent, as in all the usual operations by the crotchet and craniotomy forceps :—" The importance of the principle now inculcated can hardly," he says, " be over estimated. Next to the introduction of the forceps into modern practice, the idea, when the preservation of the child's life is hopeless, of diminishing the size of the head by compressors, instead of dragging it through the contracted outlets of the body by mere force, to the great detriment and often destruction of the mother's tissues, seems one of the most important improvements in scientific obstetrics."

Scanzoni, in his work, advocates the operation not less warmly. In the section on the influence of perforation on the life and health of the mother, he states that the fatality of the operation and the sad results

that so frequently follow it, are not due to the perforation, but are the results of the efforts necessary for the extraction of the perforated head. We are convinced, he says, that the results will be more satisfactory for the future if a suitable perforator (he recommends a trepan) be used, and the extraction be made with a properly constructed cephalotribe.

He further speaks of the usefulness of the cephalotribe for diminishing the head and extracting it; and in a section devoted to a description of the instrument, gives the following rules for its use : —

" 1. The cephalotribe is necessary when, after perforation, the head is not expelled (the necessity for previous perforation was already insisted on).

" 2. Recourse should be had to the cephalotribe without previous perforation (which would then be impossible) when, the infant being dead, the inferior members and trunk have been expelled and the forceps cannot be applied to the head, which is above the superior strait, or in the pelvis, and cannot be extracted by manual efforts. By means of the cephalotribe the head can be seized firmly, reduced in volume, and delivered promptly without injury to the mother.

" 3. It may be used to extract the head when it has been separated from the trunk, and is engaged in the pelvis.

" 4. This instrument may be employed under the following circumstances to seize different parts of a dead fetus :—

   " *a.* To extract the breach of a dead child when there is a difficulty in its passage through the pelvis, or its passage endangers the safety of the mother.

   " *b.* To compress and extract the shoulder when it is delayed after the head has been disengaged, when other methods have failed, and the diminution of the volume of the thorax is indispensable; the cephalotribe is greatly to be preferred in this case to the use of cutting or pointed instruments which can wound the uterus.

   " *c.* To diminish the volume of the thorax, after the expulsion of the lower extremities, when it is sufficiently large to prevent the extraction of the arms which are turned upwards.

   " *d.* Finally this instrument may be recommended in presentation of the trunk, when the thorax is so engaged in the pelvis that it is impossible to introduce the hand into the uterus to perform version—the chest may be broken and a passage so cleared into the uterus."

" Conditions of operation :—

" 1. It is necessary that the pelvis should have dimensions sufficient to allow the broken fetus to pass when we wish to extract with the cephalotribe. If it be less than O^m·068 (2·69 English inches) in its shortest diameter the operation cannot be performed without exposing the mother to grave risks, if the child be mature, and no accoucheur

should attempt it. It may be tried when the fetus is not fully developed, and is of small size, though the pelvis is not more than O$^{m.}$055 (2·16 English inch) in its shortest diameter.

" 2. The os must be sufficiently dilated.

" 3. The head must be fixed in the brim of the pelvis, or so placed that it may be fixed at the brim by pressure applied to the abdominal walls."

The objections that have been urged against the cephalotribe are chiefly as follows :—

1st. The imperfection of the instrument. 2nd. That while it diminishes the diameter of the head in one direction it increases it in the opposite. 3rd. That in comminuting the bones it causes splinters, which may protrude through the skin and injure the soft parts of the mother.

Dr. Churchill, in the fourth edition of his *Midwifery,* says the appearance of the instrument is so formidable that he doubts if it could be used in this country, and he is not aware that the attempt has been made.

This refers to Baudelocque's cephalotribe, and speaking of the same instrument, Dr. Murphy says :—" Look at it and ask yourselves how could it be used in Elizabeth Sherwood's case—to me it seems impossible." Dr. Tyler Smith makes a somewhat similar objection. In no other English class book that I am aware of is the cephalotribe even mentioned.

A comparison of Sir James Simpson's cephalotribe with some of those that preceded it will sufficiently remove the objections to the instrument on account of its enormous proportions :—

Measurements of Cephalotribes.

	Weight	Entire Length	Blades					Handles		Power
			Length	Breadth	Thickness	Breadth Closed [a]	Pelvic curve [b]	Length of Handles	Length of Joint	
	lbs. oz.	In.	In.	In.	In.	In.	In.	In.	In.	
Baudelocque,	4 12	20½	10½	$1\frac{3}{12}$	—	$1\frac{9}{12}$	—	—	—	Winch and screw
Hodge, .	lbs. 3¾	19½	Shank $6\frac{5}{12} \times 3\frac{3}{12}$ $9\frac{10}{12}$	$1\frac{5}{12}$	—	$1\frac{6}{12}$ Curve for Head	3	$9\frac{6}{12}$	—	Screw and fly-nut.
Scanzoni, .	—	18·66	10·15	0·98	0·27	2·04	3·81	8·54	—	Screw and lever, with travelling bar.
Braun, .	—	16	8	$0\frac{11}{12}$	$0.\frac{2}{12}$	$2.\frac{2}{12}$	—	$6\frac{6}{12}$	$1\frac{6}{12}$	Screw and joint in handle.
Simpson, .	2¼	14	8½	$1\frac{1}{8}$	—	2	$2\frac{3}{8}$	4½	1	Screw and fly-nut.

[a] Breadth of blades closed is measured across the blades when locked and closed, and includes the thickness of the blades except in Scanzoni's.

[b] The pelvic curve is measured by placing the instrument on a horizontal plane and measuring the length of a line falling perpendicularly from the highest point of the blade to that plane.

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The second objection that I have mentioned, that all the diameters of the head are exaggerated except that in which the instrument is applied has been examined by Hersent by experiments made on the heads of twenty dead children. In five instances in which the cephalotribe was applied, without the head having been perforated and emptied of its contents, he found that the diameter in which the blades were applied was diminished, while all the other dimensions were exaggerated. In the other instances, in which the head had been perforated and emptied of its contents, all the dimensions were diminished.

These experiments were repeated by Hodge, but he does not seem to have perforated and emptied the cranial contents in the first place. The transverse diameter, where the blades were applied was easily reduced, he says, to two inches, while the occipito-mental diameter and the cervico-bregmatic were lengthened.

Dr. Hodge also found that the bones were turned inwards upon the cavity of the cranium, and though fractured, in no case did they penetrate the scalp, even when no perforation had been previously made.

The head that I exhibit is one on which I operated with the perforator and cephalotribe, in the month of June last; and on inspection it will be seen that the bones collapsed and turned inwards under the pressure of the blades, and that while the transverse diameter was shortened there was no, or scarcely any, lengthening of the other dimensions.

I have now shown, so far as authority can do so, that the operation of cephalotripsy is worthy of more consideration than it has hitherto received in the Dublin school. My own experience of the cephalotribe, as a means of extracting the head after it has been perforated, and the brain has been broken down, that is, of lessening the size of the head and of drawing it through a narrow pelvis, leads me to regard it as a most admirable instrument. By the use of it the danger of craniotomy may be reduced to a minimum, and in many cases delivery safely accomplished, in which but for it we would be called on to recommend the Cesarean section. Not that I think it can ever supersede this operation altogether, but it will lessen the number of the cases in which the necessity for this last resource of our art will arise.

Of cephalotripsy without the previous use of the perforator I have no experience, nor do I think that it should ever be resorted to in head presentations till the contents of the cranium have been broken down.

I have now used the cephalotribe in three operations. The first was the case in which the head just referred to was removed. It was the mother's first labour—the pelvis was small in all its diameters—the head lay in the brim in the third position of Naegele, Dr. Sinclair and Professor Haughton were present at the operation. Dr. Sinclair and I first tried to deliver her with the forceps, which was easily applied, but by no effort that we thought it prudent to make could we move the head

from its position. The fetal heart had not been heard, though we searched for it carefully, and as the mother's condition demanded relief, I perforated, and applied the cephalotribe, and extracted the head with great ease. The woman made a rapid recovery, and left the hospital on the ninth day.

The second case was that of a woman living in a court off Cuffe-street. She had been delivered by craniotomy four times previously; once by myself, once by Dr. Sawyer, by Dr. Ringland, and by Dr. Mason. I was called to see her on Saturday, 24th November. She had been in labour from Wednesday morning. It was a head and arm presentation; the promontory of the sacrum projected very much forwards—the brim was under three inches in its antero-posterior diameter, and the head was completely above the brim, being prevented by the arm from becoming in any way engaged in it. The fetal heart was inaudible. The mother was in a state approaching collapse. So tender was the abdomen that she could not bear the slightest touch; she had constant vomiting, the surface was cold, the pulse almost imperceptible, and the uterine contractions had ceased for some hours. In the absence of my colleagues, Drs. Ringland and Sawyer, Dr. Churchill kindly saw her with me; and I was very glad to have his co-operation, for while it was imperative that the woman should be delivered immediately, I feared she would die under the operation. With Dr. Churchill's assistance, I perforated and broke up the brain, and then applied the cephalotribe. The head was so movable, from being completely above the brim, that I attempted to fix it with the crotchet, while introducing the cephalotribe, but I found this interfered with the proper application of the blades, causing them to slip when I began to extract, so I removed the crotchet and reapplied the cephalotribe, while Dr. Churchill steadied the head by applying his hand on the abdomen of the mother. The head was easily seized and compressed, and was extracted with a degree of ease that surpassed my expectations. However, the operation had been too long delayed, the woman never rallied, and died in about eighteen hours. The ease with which the head was extracted in this case was very remarkable. Under the extractive efforts it rotated in the pelvis so as to bring the shortened diameter into the narrowest part of the pelvis, and I have little doubt that the efforts that would have been necessary to extract it with the crotchet would have caused the woman to die under the operation.

The third and last case in which I have used the cephalotribe (for, fortunately craniotomy is not required as frequently now as when the use of the forceps was less known) occurred on the 28th December last. It was the woman's second labour; she had been delivered previously in the Rotundo hospital, by Dr. Cronyn, by craniotomy, and her recovery was retarded by the occurrence of pelvic cellulitis, which prevented her leaving the hospital for six months. When I saw her I found the os very nearly

fully dilated, but still presenting a rigid band all round it. The head, which presented, seemed to be hydrocephalic, and one of the parietal bones had passed through the os, while the remainder of the head was above the brim, which was very much encroached on by the promontory of the sacrum; labour had commenced three days previously, by early rupture of the membranes. The woman was flushed, skin hot, belly tender, and she had vomiting—fetal heart not to be heard. Dr. Cronyn kindly saw this woman with me, and recognized her as having been the subject of a very difficult and tedious operation by the crotchet. We at once perforated and applied the cephalotribe; on making the first effort to extract I experienced some difficulty, so I unscrewed the instrument, and applying it in another direction, gave the bones another squeeze, when I was enabled to extract the head without further difficulty. The shoulders were now caught at the brim, and Dr. Cronyn, who kindly completed the delivery for me, as I was suffering from a severe attack of influenza at the time, had very great difficulty in extracting them—so much so, that we thought of applying the cephalotribe to break down the thorax—but after some time he completed the delivery without this.

The next day the pulse was down to 90, and soon came to the normal standard, and the woman made an excellent recovery, notwithstanding that a portion of the lip of the uterus was found, after delivery, to be almost entirely detached and hanging in the vagina. How this portion of the lip was injured I really cannot say; it was certainly not done by the cephalotribe, because it was the posterior lip, and the blades were applied laterally. I incline to think it was caused by the long-continued pressure between the head of the child and the promontory of the sacrum, which was very sharp and projecting.

These cases have fully convinced me of the superiority of the cephalotribe over all other methods of extracting the head after it has been perforated. In two respects, I think Sir James Simpson's instrument capable of improvement. The pelvic curve, which is less in his than in most others, might, I think, be done away with altogether with advantage. In cases of antero-posterior narrowing, it is desirable to turn the shortened diameter of the head into the short diameter of the pelvis, and the space through which the head will have to rotate when turned with a straight instrument will be considerably less than when turned with a curved one—besides, the introduction of a straight blade is easier and safer than that of a curved one.

The lock might also, I think, be reversed with advantage. That is made so that the lock of the upper or right blade will look forwards when the blade is introduced. This would, I think, be an improvement in the construction of all midwifery forceps, as well as the cephalotribe. I have a forceps of very old date made in this way; and in the museum of the Rotundo Hospital there is one labelled as Denman's, made in the same

way. Why all our modern instruments are made differently I cannot tell. The present construction obliges us to adopt one of three courses:— *a.* Follow the rule laid down by Rigby, and introduce " the upper or lower blade first, according as its lock is directed forwards; *b.* Introduce the second blade behind the first; *c.* Introduce it in front of the first, and afterwards cross the handles so as to bring the locks opposite to one another. Each of these courses is objectionable. The first, because it implies, as instruments are at present constructed, the introduction of the lower blade first. The second, because it interferes with the proper placing of the instrument when the head is high up, as it is then necessary to carry the blade as far backwards as the perineum will permit, that the blade may be properly placed on the head, and that the first tractions may be made in the axis of the brim of the pelvis. In the third method there is some risk in crossing the handles of displacing the blades however well they may have been applied, and in a narrow pelvis the crossing of the handles may not be easily accomplished. By making the instruments so that the lock on the upper blade will, when it is introduced, look forward, the lower blade can be introduced in front of the other, and the locks will come properly into position; and while the introduction of the instruments is thus much simplified their utility is in no way impaired. I have had a cephalotribe made for me by Messrs. Fannin, resembling Sir James Simpson's, but without the pelvic curve and with the reversed lock, and I believe that with these alterations it is a very perfect instrument.

In using the cephalotribe when the head presents perforation is performed in the ordinary manner, and the brain carefully broken up. Then the blades of the cephalotribe are introduced in the same way as the forceps, but care must be taken to pass them up sufficiently high to grasp the base of the skull, as the great object of the operation is to break it, and reduce its size. For this reason the points of the instrument, especially when the head is high up, must be passed well forwards, and the handles must be carried back as far as the perineum will admit, and the reversed form of the lock will now be found specially useful. When the blades are locked the screw is passed through the openings in the handles, and by screwing the handles together we crush the head. This being done, we now proceed to extract it, when, if any difficulty be experienced, the head may be rotated so as to bring it, with its shortened diameter, to the narrowest part of the pelvis; and here the advantage of having an instrument, without the pelvic curve, will be experienced. If there still be difficulty the blades may be applied to the head in another direction, and the base of the skull again broken; and this may be repeated if necessary, and then extraction performed as if with the forceps.

In cases of extreme narrowing of the pelvis, Professor Pajot[a], of Paris, operates by repeated crushings without tractions, a method that he recommends when the pelvis measures under six and a half centimètres (2·5 English inches), and which he says may be practised where it is not more than 27 millimètres (1·06 English inches), the smallest size that will admit the introduction of the instrument.

As soon as the os is sufficiently dilated he perforates ; and when it is large enough to allow of the introduction of the cephalotribe, he effects the first crushing, taking care to grasp the base of the skull.   Then he slightly rotates the head to the right or left as he finds most easy, but does not persist in his efforts to do this if he finds much difficulty, as the uterus itself will, in a little time, and often in a very short time, rotate the head so as to bring its diminished dimensions into the narrow part of the pelvis.   After the first crushing he withdraws the instrument without traction, and proceeds immediately to make a second and even third crushing, and then the patient returns to bed.   According to the general and local state of the patient, and the weakness or energy of the uterine contractions, he repeats these crushings every second, third, or fourth hour, making two or three crushings at each sitting ; in some cases one or two sittings suffice.   The head, broken and elongated, is expelled by the uterine contractions ; and if the thorax present any difficulty it also is crushed once or twice.

M. Pajot recites seven cases where this method was practised, the leading features of which I have condensed into the following table :—

Pelvis measured	English inches		No. of Sittings	Head expelled		In about
6 C. M.	= 2·36.	Successful.	2.	(spontaneously)		24 hours after perforation.
5 C. M.	= 1·9.	Fatal.	2.	„	14	„
6 C. M.	= 2·36.	Successful.	1.	(slight traction)	—	„
6 C. M.	= 2·36.	Do.	1.	(spontaneously)	5	„
5 C. M.	= 1·9.	Do.	4.	„	13	„
6 C. M.	= 2·36.	Do.	2.	„	8	„
36 M. M.	= 1·41.	Fatal.	Cephalotripsy attempted in three sittings with an imperfect instrument before M. P. saw the patient; he operated once, but the patient died undelivered two hours afterwards—uterus ruptured.			

Professor Van Leynseele[b] says truly of this method that it is only applicable to cases where the operation is determined on and commenced before labour has made much advance, or the woman suffered any fatigue, or the soft parts any compression ; but in the majority of cases,

[a] Archives Générales, Mar. 1863.
[b] Résumé du Cours d'Accouchements donné à l'Université de Gand.

where cephalotripsy is required, the condition of the mother would not permit of any such delay and prolonged and repeated operations. I believe, however, the method is well worthy of being borne in mind, if we should meet with a case of labour in an early stage, especially if the child be dead, where the pelvis is greatly deformed, and where the decision comes to lie between embryotomy and the Cesarean section.

In conclusion, I recommend the adoption of the cephalotribe in all cases of embryotomy in preference to crotchets, hooks, and craniotomy forceps, for the following reasons :—

1st. By its use the base of the skull, the thorax, or pelvis may be completely broken up and reduced to the smallest possible dimensions without injury to the mother.

2nd. It holds the part to which it is applied so firmly that it can be rotated if necessary and extracted with ease and safety.

3rd. It causes no spiculæ, as the crotchet does, to tear the soft parts of the mother.

4th. It does not, like the crotchet, endanger the mother or the hands of the operator by slipping or perforating the part to which it is applied.

5th. It reduces, for the foregoing reasons, the dangers of embryotomy to a minimum, and allows of its performance in cases where it would not otherwise be possible.—*12th January*, 1867.

TRANSACTIONS OF THE COUNTY AND CITY OF CORK MEDICAL AND SURGICAL SOCIETY.[a]

SESSION 1866-67.

Dr. Cremen, *President*, in the Chair.

Cholera. Illustration of the Doctrine of Contagion in Cholera, Drawn from the Epidemics of 1854 *and* 1856, *at Mauritius.* By Gordon K. Hardie, M.D., Surgeon 73rd Regiment.

Having, twelve years ago, had my opinion on the subject of contagion in cholera completely reversed by what I saw and learned in the two great epidemics, in Mauritius, of 1854 and 1856—and having been one of the members of the committee appointed to investigate and report upon the epidemic of 1854, I think I may be able to put facts before this society which seem hardly capable of any other interpretation than the importation and transmission of cholera by means of contagion.

It is not intended, however, in discussing the question of contagion, to restrict this term to personal contact or intercourse merely. The main

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[a] These reports are supplied by Dr. Purcell, Secretary to the Society.

point to determine is, whether mere epidemic influences of atmospheric or telluric origin, of utterly unknown quality, facilitated by bad local sanitary conditions, are adequate to originate the disease ; or whether it does not require the presence of a specific poison, originating, and capable of being reproduced, in the human body, and diffusing itself, either by emanations from the body or its excretions, or by passing into earth, air, or water, or by attaching itself to clothes or other fomites. The latter, in its various modes, just indicated, I hold to be the correct view.

In the earlier epidemics in Europe the first view was very generally held. It seems to have been thought politic by the authorities, and perhaps by medical men, to diminish panic by declaring the cholera to be non-contagious. Every successive epidemic seems to lessen the number of those holding this view, though many still attempt to limit contagion to some particular mode, of which water-contamination is at present the favourite.

I believe that a thorough knowledge and analysis of all that is known will result in proving that the poison is a most persistent one, being transmissible, directly or indirectly — remaining, with undiminished power, when hidden from sight for days and weeks, among folded clothes locked up, or sinking into the earth to contaminate the water at a later date ; while its greatest and most rapid power is seen on the introduction of infected persons into a previously healthy locality, and among people never before exposed to its influence.

In India, where it is endemic, these epidemic explosions are not so easy of appreciation, and nowhere has the contagious nature of the disease been less dwelt upon or believed.

Mauritius, on the other hand, is admirably circumstanced for the study of cholera contagion. A little island in the Southern Indian Ocean, thirty-six miles in greatest length and twenty-seven in greatest breadth, belonging rather to Africa than Asia ; separated, on the north, from India, by nearly thirty, *and from Calcutta, the focus of its cholera contagion, by nearly forty degrees of latitude*—with steady sea breezes, from the S.E. trade, for three-fourths of the year, with its capital town and only port of entry for foreign vessels on the LEEWARD side of the island, north-west, where yet, invariably, cholera has first made its appearance— with several races inhabiting it, of different habits and varying susceptibility to the disease—with certain localities enjoying an immunity, due, apparently, to the absence of running water—and with a sister island, Réunion, under the French flag—and with a stricter quarantine, and a less Indian immigration, escaping altogether in 1854.

The great endemic disease of the island is dysentery, which is very rarely associated with hepatic abscess, that most formidable complication of tropical dysentery, in malarious countries.

There is no local malaria in the island, intermittents being unknown among the Creoles, who have been born and bred in the island, and have not been exposed to malaria elsewhere. They are common among the Indian emigrants.

Cholera had appeared at four different periods up to 1856, when my connexion with the island ceased, with prolonged intervals between the three first epidemics.

There are no exact records of the first outbreak in 1775, but it is thus alluded to in a report to Government by a committee of British medical officers, appointed to report on the epidemic cholera raging there in 1819:

" From the reports of several individuals, some of whom belong to the medical profession, it does appear that a disease, most strongly resembling in its symptoms, progress, and termination that now under consideration did for some time prevail in the colony in the year 1775."—(Report, 1856, p. 107.)

The second epidemic, in 1819, was universally believed by the inhabitants to have been imported by H. M.'s ship Topaze. Nothing has ever shaken that belief in the popular mind.

The committee, writing on this point, declared " that from a consideration of the history and progress of this disease, they feel the strongest persuasion that it is not of a contagious nature, and that it is *not of foreign introduction*."

This finding is in conformity with a very strong hint from the governor, General Darling, who writes to them in the following strain :—
" It is unwise, if not criminal, to add to the apprehensions of the most unenlightened part of the community, who are not, on occasions of this sort, qualified to judge for themselves ; and it must be necessary to point out to the committee that the estimation in which their character individually is so deservedly held, will, with proper exertions, be a means of subduing the alarm which appears to have been entertained, and which, indeed, still exists in the minds of many of the inhabitants."

So this epidemic was dismissed, without any gain towards the solution of the question of contagion.

From 1819 to 1854, a period of 35 years, epidemic cholera seems to have been wholly absent from the island.

After the abolition of slavery, the labour question became the great problem, which was ultimately solved by the introduction of Indian immigrants on a large scale. In 1854 they formed the largest section of the population—

Indians,	-	-	- 78,388
African race.		-	- 48,140
Europeans and half castes,			55,348

181,876 on the 25th May,

1854.—(P. 119, Report, 1854.)

The terrible nature of the epidemic of 1854 will be at once appreciated when I state that in the month of June $\frac{1}{30}$ of the whole population was swept off by cholera, 6,035 deaths taking place from it.

The total mortality from cholera, from the 25th May to the 31st August, was 7,650.

Indians,   -   - 2,280, out of a population of 78,388=29 per 1,000
Africans,   -   - 3,832,   „   48,140=79   „
Europeans and half
    castes   -   - 1,538,   „   55,348=28   „

The vessel alleged to have been the cause of this great calamity was the Sultany, an immigrant ship.

It left Calcutta February 14th, with 375 immigrants, and a crew of eighty Lascars. It reached Mauritius 24th March, having lost thirty passengers from cholera, which broke out thirteen days after the ship left the land heads, and seventeen after leaving Calcutta. It is most probable, from the long interval, that the outbreak had its origin in opening out some infected clothing on board. This being Dr. Clinhew's view (the provincial medical officer), who stated in evidence that several similar instances were known to him, which he had been led to attribute to this cause.

No case occurred among the crew during or after the voyage. Ordinarily, the period of first outbreak in these ships is while they are still in the river Hooghley.

The ship was put in quarantine, and under the inspection of a guard boat, at the Bell buoy, till the 30th of March, when it was ordered off to Flat Island, to land the Coolies, for thirty days' quarantine, and to return to its anchorage for ten days' quarantine of observation. But the ship did not start for Flat Island till the 7th April, and during the interval she lost five more from cholera and dysentery. She landed the immigrants on the 9th, returned to Port Louis on the 11th, and got pratique 19th April.

The immigrants improved in health so much that they were released from quarantine on the 1st May, having only lost three more—one from accident, and two from fever and debility. Their clothes were not destroyed. On the 4th May they were distributed through the island, among various estates. Of 307, one died between the 3rd May and 4th June; on five estates, where seventy-six were located, no deaths took place during the epidemic; while the total mortality in the other estates, where 238 immigrants were located, did not exceed fifty-seven among all classes.

The disease had already begun in Port Louis before these men came back, and it is, therefore, not probable that the epidemic arose from their distribution through the various districts. The origin most generally credited was, that, while the ship was at anchorage at the Bell buoy

under charge of a guard boat, the quarantine was broken by the captain going to Grand River, during the period between the 24th March and 19th April, to visit a house where two of the earliest fatal cases took place 6th and 7th May (page 7 of Report). Mr. Birichon asserted " that when the Sultany was in quarantine in front of Rochebois, he saw, almost every evening, a boat, with the word ' Monton' on the bow, communicate with the said vessel."—(P. 7).

The authorities, as in 1819, endeavoured to show that several sporadic cases had occurred prior to the arrival of the suspected ship. It might, at all times, in a large community, be easy to find cases of rapidly fatal diarrhea.

Seven were brought forward on this occasion, of which two only were fatal; one of whom had assisted at the exhumation of a corpse, returning, worn out with fatigue, December, 1854. The other was a fisherman, whose energies were daily taxed to procure food for his family. He died in February of diarrhea. The latest of the favourable cases was in the first half of March.

Between the 10th and 16th of April four cases of cholera appeared in Port Louis, of which two were fatal.

The next two were in the house said to have been visited by the captain of the Sultany, on the 6th and 7th of May. On the 12th, two more died of cholera, at Grand River, and one in Port Louis. On the 14th it broke out epidemically in the civil prison of Port Louis. Fifty-two cases, of which nineteen were fatal, occurred among 655 prisoners up to the 19th, when the prison was emptied of all but forty-five, of whom one died, and the prisoners sent to Flat Island and on board of two hulks, to which an hospital ship was attached. In the vessel the ultimate mortality from cholera was 150. Of 230 sent to Flat Island, 199 returned, August 5th. Only 303 of the prisoners ultimately returned to the prison, including those left behind.—(Page 3).

" During the latter half of May the mortality continued to increase in the town, and by the end of the month, 639 declarations had been made, of which 377 occurred between the 25th May and the end of the month, which were exclusively cholera casualties.

" By this time an universal panic had taken possession of the inhabitants of Port Louis. Most of those who had conveyance at command had fled into the country; the roads were covered with groups of fugitives, laden with their household goods, and seeking, in the purer aspects of the country districts a security they were not destined to enjoy, but into which, in many instances, they carried the germ of contagion, and, dying themselves, left a legacy of death to all around them. It is calculated that 10,000 people abandoned the town. Business was nearly at a stand still; a great part of the shops were shut.

" The streets leading to the country presented a long line of funeral processions."—(Pages 3 and 4).

It may be convenient for reference to tabulate the dates hitherto given.

February 14.—Sultany left Calcutta.

March 3.—Cholera appeared on board. Thirty deaths during voyage from it.

March 24th.—Arrival at Mauritius.

April 7th.—Left for Flat Island to land immigrants.

   ,,   9th.—Landed them.

   ,,   11th.—Returned to the Bell buoy, in quarantine.

   ,,   19th.—Got Pratique.

May 1st.—Immigrants released from quarantine.

   ,,   4th.—   Do.   distributed through the island.

Dates of cholera beginning in the island :—

April 10th.—Two deaths in Port Louis.

   ,,   16th.—Two attacks ; one death.

May 6th and 7th.—Two deaths in the house which the captain of the Sultany was said to have frequented, at Grand River.

May 12th.—Two deaths also at Grand River.

                 One   ,,   in Port Louis.

   ,,   14th—19th.—Fifty-two cases, with nineteen deaths, in civil prison ; and disease becoming epidemic in the town.

The population of Port Louis, May 31st, was 49,000. The total mortality from the 25th May to 1st August was 3,492, an average of fifty a day, when the usual average mortality was seven daily.

The disease penetrated into all the districts of the island by the end of May, but attacked the various estates at very different periods during the epidemic. In all the districts there were estates which had a perfect immunity, a fact hardly compatible with the theory of a general epidemic influence as determining the disease.

The various corps forming the garrison were attacked as follows :—

Two cases occurred in the Artillery Barracks, Port Louis, in May.

Four   ,,   85th Regiment, in Port Louis, in May.

One   ,,   5th Fusiliers,   ,,   June 4th.

One   ,,   Barracks at Flacq, June 8th.

One   ,,   ,,   Mahibony, June 15th.

The last barracks are particularly well placed (on a peninsula) for isolation. In both the last barracks the disease appeared later, and departed sooner, than among the surrounding population.

" The strength of the whole garrison was 1,704, of whom 56 were attacked, and 34 died = 70 per cent. of attacked. The fatal cases were 2 per cent. of the strength, which was less than half the proportion of the civil population, and two-thirds less than that of the police.

" The preventive measures taken were, thinning the barracks, putting men under canvas, or sending them to out-stations—all intercourse with the towns prohibited ; cholera belts issued ; bedding aired in the sun

every day; windows kept open day and night; and the men cautioned to report diarrhea at once."—(Report, page 8).

At this time I was quartered in the barracks of the Post of Flacq, a village and harbour on the opposite side of the island (windward) to Port Louis, and twenty-one miles distant. I was the only medical man in the place. The village had no drainage, except the natural one of the river; there were no conservancy arrangements before the epidemic broke out. The barracks and the village derived their water, for all purposes, from the river, the soldiers having to go through a part of the village, morning and evening, to bring in the water, after the cholera broke out. Except for this they were strictly confined to barracks. But supplies had to come from without, so that perfect isolation was impossible.

All was apparently well at the Post, so far as I knew, up to the 30th May. On that day, a Mr. Rénaud came down from Port Louis, with his family, ten in number, on a visit of flight to Mr. Véron, whose family numbered twelve, exclusive of seven servants. The family occupied a small one-storied house of two rooms, and outhouses, within a stone's throw from barracks.

On the 31st, I was called to see the infant child of Mr. Rénaud, ill with purging and vomiting. The child, which was at the breast, had had diarrhea before leaving Port Louis. It recovered; but another of the children, aged three, died of cholera, after forty hours' illness, on the 2nd June. From this day onward this house was a scene of constant misery and death. The child was buried on the 3rd, and the Rénauds returned to Port Louis the next day. The same day, Mrs. Véron and her son, who had both been very assiduous in their attention to the children, were both seized with cholera. She died that night; the son on the 6th. The eldest daughter was seized on the 7th; Mr. Véron was seized on the 10th, and died on the 12th. On the 14th, another daughter died; on the 15th, one of the servants; and on the 16th, an old friend, who had assisted in nursing them, died. Two servants died on the 18th, and on the 20th, another servant and child. Two more of the family were attacked, but recovered.

In all, between the 31st May and the 21st June, there were sixteen cases in this one house, of which eleven were fatal.

Contagion here showed itself in its full potency. The house, with its out-houses, was much too small for the original family; the overcrowding of ten more, laden with the germs of cholera, will adequately account for the pestilential outbreak, with its catastrophe.

No more direct proof of importation and contagion can well be adduced.

In another house, which was quite isolated, and close to the sea shore, six of the family died in twelve days, between the 6th and 18th of June:—

Father,　aged 53, June　6th.
Daughter,　„　10,　„　10th.
Grandson,　„　$\frac{3}{12}$,　„　10th.
Mother ill, also, at the time ; recovered.
Son,　-　aged 14, June 12th.
Son,　-　„　18,　„　18th.
Mother,　„　47,　„　18th.

after nursing her sick family, day and night, in spite of all warnings and remonstrances.

In another house, near the sea-side, in which sailors lived, there were seven deaths.

The second house to which I was called was that of a sailor, on the 1st June. He had returned, a few days before from Port Louis ; was soon seized with cholera, and died that day, the fourth of the disease.

Though, from the 4th of June, cholera was raging, with great virulence, close to the barracks, no case occurred there until the 8th, and was thus an isolated and exceptional case. The man, who had lost all his molar teeth, was in the habit of bolting his food, without any attempt at mastication. Large masses of manioc (a kind of jam), two inches long, were passed in his stools. Diarrhea became prevalent about the 12th, and a second case of cholera occurred in a woman on the 13th ; so that, with the exception of the case above, cholera was raging outside the barrack walls ten days before it got fairly into barracks. As all our supplies came from without, it will be seen that a perfect cordon was impossible ; but that an imperfect cordon produced marked results in retarding the advent of disease, during the period of its greatest malignancy ; for the recoveries were much more in proportion to attacks, after the first ten days.

The cholera influence was at its height in the barracks from the 14th to the 23rd June, during the last week of which, besides the cholera cases, and eight cases of diarrhea admitted, thirty-one men were treated, out of hospital, for diarrhea. Such diarrhea must be considered as an effect of the cholera contagion, operating under conditions either of diluted virus, or greater resistance to its power. Such persons have, doubtless, a considerable immunity from future risks. The general prevalence of diarrhea during epidemic cholera seems to show that the range of the disease may vary in intensity, from the most malignant form to the slightest derangement of the bowels, and that all should be viewed as one in origin, unless symptoms exist which are capable of another interpretation. Nature thus limits herself, in many cases ; and, acting in imitation, we may consider the astringent opiate treatment as the rational plan for keeping the disease to its original and least-developed form.

After the epidemic, I took a census of the population, to enable me to appreciate the effect of locality upon the mortality :—

1. In the lowest level, or sea-side part of the village, there were 21 houses, 146 occupants—24 deaths, - 16·55 per cent.
2. In the centre part, next to the barracks, there were 30 houses, with 281 occupants—27 deaths, - 9·61 ,,
  Barracks, with 133 occupants—5 deaths, - - 3·77 ,,
3. In the upper and more country part of the village, 27 houses, 337 occupants—7 deaths, - - 2·08 ,,

In the barracks, and in the upper part of the village, there were either grass plots on a large scale (in the barracks), or gardens, with cultivated patches round each house, which were also more detached than at the lower parts. The good effects of grass or vegetation in fixing nascent decomposing organic matters have repeatedly struck me, and it is greatly to be desired that open spaces laid out in grass might form part of every barracks, or establishment, where large numbers are collected, as well as in the courts and back yards of the lower parts of towns. The reciprocal give and take of the vegetable and animal worlds shows how desirable it is to associate both, wherever practicable, as by parks, gardens, &c., &c.

But it is possible that, in addition to the greater crowding of the house, and the absence of purifying vegetation, the river, at its mouth, was more contaminated than at the upper part of the village.

Clothes were washed on its banks before the cholera, without any check, and it formed the only natural drainage for the village, which was on its banks.

Connected both with questions of water supply and contagion, I may instance some curious circumstances connected with a second outbreak of cholera, in a remote part of the district of Flacq, some time after the great epidemic was over.

Cholera reappeared in several parts of the district, in October—November, coincidently with a very great scarcity of water, the river being remarkably low. I was one of a committee appointed by Government to investigate the cause of this new outbreak, and drew up the report. We called attention to the coincidence of the outbreak with the great scarcity of water, but did not see how it could be associated as cause and effect. The views of Pettenkope were not then announced, but apply to much that we found and saw. He considers that, though human intercourse is essential, the soil is the chief medium, and for that end must be porous, and permeable to air and water, and must contain subsoil water, impregnated with fecal excrement; hence elevated rocky sides suffer least, while cholera spreads in hollow positions and along the course of rivers (as I shall later show was very well marked in both epidemics in Mauritius). The risk from the secondary contagious cause is consquently greatest at the time of the recession of the ground water—viz., times of drought.

No deaths from cholera were registered in the island between the 21st

September and the 16th October, 1854—the last case declared in Flacq district having taken place 30th August. One hundred and twenty-six decided cases of cholera were verified there during October and November, of which fifty-one were fatal; and it was supposed that many fatal cases were never declared. We thought it not improbable that there had been a continuity of cases in this way which had escaped registration.

On the 28th of November (printed October by mistake) we proceeded to Plaine Larcher to investigate the *first fatal case of this epidemic*, Jean Artider. His wife told he was seized at 10 a.m., 18th October, and died the same might. In the former epidemic his mother-in-law died of cholera in the same house. No one else of his family, which is numerous, has since been ill.

From the Abbé Giles we learned that cholera first began in the Camp de Masque in the beginning of July; from the 15th to the 5th August there was no apparent cessation; from that date to 2nd September many deaths; from that to 27th October two or three cases only; from that date to 10th November a great mortality, particularly in the Mare Jackos.

"At the estate of Ben Espoir we learned that there had been two cases of fatal cholera in the first epidemic in July. Had had no case after that till November, during which there were nine attacks and four deaths. There has been great want of water of late.

"At the Reve, the estate below, 130 persons were employed; no deaths in the first epidemic; ten during this month. A Creole woman, Perrine Tornitta, was the first fatal case. She had been nursing her aunt, who died of cholera, on the 4th, in the Camp de Masque; Perrine died on the 11th. She had brought her aunt's two children down to the estate with her, one of whom died, as also her husband. The water is from a canal, which has its source at Bel Etang. It at present contains very little water, and turbid for weeks from ducks paddling in it.

"At Bel Etang we went to the head of the canal which goes to the estates just mentioned. The water there was quite clear. The River Coignard, which passes down to Mare Jackos and Queen Victoria (places affected by this epidemic), also receives water from the Bel Etang. This river is very low. The manager at Bel Etang thought that imperfect sepulture had been the probable cause of the second outbreak. He had noticed that the disease recommenced after some days rain, succeeded by others of bright sunshine.

"From Bel Etang we went to Mare Jackos to see some graves which were at short distances from the houses, covered with loose stones (some were probably superficial)."

At the bottom of the Mare we found the bed of the River Coignard quite dry. A small canal, with muddy water, was running about twenty yards from it.

Our last visit was to the cottages, apparently in a most healthy

locality, freely exposed to the sea breezes, being at the top of a slope, commanding a view of the sea. Everything showed that the inhabitants had taken pride in the neatness of their property. Yet in these two houses there have been five deaths, and they are now deserted. The graves are in the lower part of the garden, on the sea slope. There is no spring, and *all the water is brought from the canal.*

Articles of bedding were lying exposed in the garden, which we ordered to be burnt, &c., &c.

Next day we visited the Riviere Leche and the estate of Clemencia, marked in the map Hermitage, where of late there has been a great mortality.

The situation is high up, between the Montayne Blanche and the Montayne Fayence, and, as the crow flies about two miles from Mare Jackos.

About 300 yards from the sugar-mill of Clemencia, we stopped at a closed shop, near which are several cottages of Creoles, from whose account we got as follows :—

During the first epidemic, about four months since, two persons, one of whom was the owner of the shop, had died of cholera, since when it had remained closed. On the 13th of this month (November) Madame Alfred, sister-in-law of the former owner of the shop, wishing to know if her shawl was in the house, had a window shutter opened, put her head through the window, and saw her shawl on the floor. She did not remove it, but remarked, on withdrawing her head from the room, that she was " frappée par la mauvaise odeur." The same night she had looseness in the bowels. She went into the woods next day, but during that night became worse, and next evening cholera had fairly declared itself. She died on the 17th. A child whom she had adopted, aged two, was taken ill the same evening, and died the same night.

Another child, Léonore, whose mother had been in constant attendance on Madame Alfred, living within fifteen yards of her, was taken ill at the same time, and died on the 18th. On the same day a carpenter, who lives at a short distance, at the foot of the Montayne Blanche, came here to make a coffin for Léonore; he was seized with cholera on the spot, and died the same night.

On Sunday, the 20th, another Creole, Augustin, whose house was pointed out to us, was taken ill, on return from Mass, and died the same night.

The father of the child Léonore was seen by us in bed, having had an attack of cholera, characterized by all the usual symptoms. His eyes were still sunk, and his face expressive of the cholera state.

From this we proceeded to Clemencia Estate, where there are 458 persons employed. Here cholera appeared among the Indians, about

the 20th November, on which date the first fatal case occurred. Up to November 29th there have been seventy-eight cases more or less grave; of these seventeen have died, and about twenty-five are now convalescent, who have had severe attacks; the remainder were trivial cases. The deaths have been entirely among Indians. To-day many are absent from fear.

The situation of this estate, and of the Creole houses before mentioned, is at the head of the Rivière Lèche. There is a quantity of swampy land at the bottom of the valley. The Creoles informed us that they drank spring water. The manager here tells us that there is a good spring at the side of the hill, not far from the camp, but thinks that the Indians almost exclusively use the water from the marsh. He has formed no opinion as to the cause of this new epidemic; he says that there is constant communication between the Indians of the estate and the Creoles, whose houses we had just left. They go to shops close to that spot.

On referring to the statistics of the first epidemic in the report, I find that here, up to the end of the first epidemic, there had been 120 cases of cholera (in a population of 725), which, I presume, was choleraic diarrhea mostly, as no fatal case is recorded. The date of the first case was June 22.

It is therefore clear that the ground round about must have been largely contaminated by choleraic discharges, which, in a time of drought, would seriously contaminate the soil and subsoil water.

We came to the following conclusions on the questions propounded by the Government:—

1. That the disease as now existing is in all respects the same as the cholera on its first appearance in the island.

2. The chief places where it has of late prevailed are the Camp de Masque, on both sides of the road, particularly at Mon Reve and Bon Espon, on the right hand, and at the Mare Jackos and Queen Victoria on the left. Latterly it has prevailed, with great intensity, at the head of the Rivière Lèche, between the west ends of the Montaynes Blanche and Fayence. It is to be noticed that more than ten days before fatal cases of cholera reappeared in the Camp de Masque there had been fatal cases registered at Frois Islots and Plaine Larcher. According to the list furnished to Dr. Hendée, from the office of the district magistrate, it seems that no death is reported between the 21st September, when one occurred in the Camp de Masque, and the 16th October, when one is recorded at Trois Islots, followed by two others in the same locality on the 20th. These cases were verified by Dr. Guiot. On the other side of the district, on the 18th, the fatal case at Plaine Larcher occurred, ten days after which the first fatal case is registered from the Camp de Masque. The only connexion, by intercourse of infected people, is that

of a child, "Riche," who had been staying at Plaine Larcher for some days, and on his return to the Camp de Masque died of cholera. His name is not in the magistrate's list, and his father could not give in the date of his death.

3 and 4. We have not succeeded in tracing the disease in the Camp de Masque back to any origin external to it. On either side of it sporadic cases were occurring at a time when, judging solely from the bills of mortality, it seems to have wholly ceased there.

When once returned there seems to be proofs of transmission from one part to another by intercourse.

It may fairly be doubted if the disease has ever been extinct in the district since its introduction.

The soil in the Camp de Masque has of late been dry to the last degree; and there is always good natural drainage, except in the course of the River Coignard, at the bottom of Mare Jackos. There is everywhere in it, at present, a complaint of scarcity of water, which has coincided very nearly with the reappearance of the disease. We do not, however, see any reason for associating the two in the relation of cause and effect.

The district about Hermitage is always marshy. We have mentioned Mr. Fonteney's idea of careless interments, but there has been no evidence to show that they have been superficial.—(P. 113).

In connexion with this account of a secondary epidemic, I may bring forward the influence of water supply upon the disease in Flacq and in other districts.

Generally the estates along the coast, from Flacq to Grand River, south-east, suffered little, compared with those on the high road, several of which suffered very severely; at La Caroline out of 410, 146 were attacked, and 115 died.

One part of the high road (from Port Louis to Flacq) enjoyed a marked exemption, viz., that between the fifteenth and eighteenth mile stones from Port Louis. It is remarkable that in this part there are no running streams from which drinking water could be taken; the water being drawn from wells; and a similar piece of good fortune was felt at Samarre, a hamlet opposite the fourteenth mile stone, where a number of the African race were crowded together, and where the epidemic was expected to rage with violence.—(P. 17, Report, 1854).

In the report on the district of Pamplemousses the Government medical officer reports, that "along the banks of rivers and canals it was very virulent, and the victims have been very numerous in the neighbourhood of ill ventilated and badly drained places. All the borderers of the Callebasse River and the old Bois Rouge Canal suffered."—(P. 17, *idem*).

Dr. Clerehew, in the report of the epidemic of 1856, says of this district:—"The mortality has been very great, particularly, as in 1854, along the borders of the canals that exist in this district."—(P. 104 of 1856).

In the Rivière de Rampart district Dr. Gorelay observes, that "from the commencement of 1854 disease of the intestines and diarrhea were very prevalent at the Piton, which he attributes to the use of the water of Rivière de Rampart Canal, which crosses several estates before arriving at the Piton, and the quality of which is deteriorated by the detritus and other impurities with which it is charged ; to this cause he further attributes the persistence and intensity of the epidemic in this part of the district."—(P. 121).

In the district of Grand Port the report says :—"The usual immunity from disease in those parts of the district in which there exists a scarcity of running water was observed."—(P. 19).

Local conditions of bad sanitation were not always found coincident with the ravages of cholera.

"Parts of the town of Port Louis, where putrid emanations were most abundant, and the houses situated in the most unhealthy places, suffered less than others, where the air was less tainted and the houses better cared for.

"The Arabs and Malabars in the Bazaar were crowded together in the same room with various animals, and always with quantities of perishable goods, often in a semi-putrid state. The horrible state of these lodgings was known, and dire results were anticipated ; contrary to which, the epidemic was less virulent and less fatal than in the most airy and cleanly parts of the town."—(P. 9). A probable solution of this is, that this population was one already acclimatized to cholera influences.

"Another remarkable fact is, that the persons whose business exposed them to daily encounters with the most poisonous emanations did not furnish a corresponding increase of cases of cholera. The Inodore Establishment employs 150 Indians, of whom 90 are constantly collecting the refuse of the streets in the scavenger carts, or in going round at night collecting night soil. Of these 90 men, 15 were taken ill, and 15 died. The director of these establishments attributes these casualties, not to the exhalations from the soil, but to the fact of these men having been obliged to penetrate into the yards of the houses, and to their having carried away with them clothes which had been worn by persons dead of the epidemic, and thrown on the dunghill by their relatives. Of the remaining 60, who were employed in the manufacture of manure from the soil, only two were attacked, who were old men, worn out, and pre-disposed to suffer from any epidemic.

"From twelve to eighteen grave-diggers were employed daily by the municipality ; of these men, who pursued their avocations from morning to night, under most distressing circumstances, during more than two months, only two fell victims to cholera."—(Page 9).

Exemptions among Charcoal Burners and Chinese.—"Near Grand River there was an Indian camp—a number of earthen hovels with thatched

roofs; the doors so low that one must stoop to enter; and the interior seldom high enough to allow a full-grown man to stand upright; no window nor aperture, save these doors, no ventilation, no light, no sunshine. The ravages of cholera might have been calculated to reach their acme in this unwholesome spot. On the contrary, fewer persons were affected here than in the neighbouring high ground, or in the most favourably situated parts of Port Louis. Perhaps this immunity may be in some measure ascribed to the fact of about a 100 of these Indians being charcoal burners; for it is ascertained that not one of these suffered from cholera, nor did the epidemic once come into the houses in Port Louis where depots of charcoal were kept."—(P. 10).

Effects of a strict Cordon Sanitaire.—" A strict cordon was kept on the Civil Prison at Flacq, in which there were upwards of 100 persons, and no case occurred.

Mr. Mintocahio isolated Belle-marre by a strict cordon, and escaped altogether the visitation of the cholera."—(Page 17).

The Chinese enjoyed an almost entire immunity from mortality—two in 1,800 men. A Chinese doctor informed us " that they seldom drank anything but tea (the equivalent at least of boiled water); that they eat animal food freely, and pork in particular, and a daily preparation, or paste, from shell fish, imported from China; that they smoked a vast quantity of opium; and that this was the great preservative, secret, and shield."—(P. 10).

Their sanitary state, generally, was as bad as was to be found in the island, as regards their dwellings and habits.

The African race, on the other hand, showed a special proclivity to the disease, and, as before seen, a triple ratio of mortality compared with the general and Indian population.

The cause of this may be a greater susceptibility of race, and that absence of prior cholera acclimatization. They were virgin soil for cholera germs.

That there is an acclimatization to cholera is, I think, very probable. Though there is much to balance in point of time, during which the two epidemics existed in 1854 and 1856, the difference of mortality is very marked :—

In Port Louis, 1854, . . . 3,492.
        ,,   1856, . . . 1,397.
In the island at large, 1854, . . 7,650.
        ,,   1856, . . 3,223.

The mortality of the garrison in 1856 was thirty-five, having been twenty-eight in 1854. But Dr. Clerehew, the principal medical officer, remarks :—" The soldiers who have recently arrived, and were not present during the epidemic of 1854, form but a small part of the garrison of Port Louis; yet these men have furnished about three-fourths of the military victims of the present epidemic.

In both epidemics the attendants of the Civil Hospital escaped cholera almost wholly. The sick in hospital were equally fortunate.

The epidemic of 1856 repeats the story of introduction from without by ships from India. The Hyderre arrived January 5th, and the Futty Mumbarruck on the 8th, both with a high mortality and sick list (747 embarked; 55 died on board).

They were put into quarantine of observation until the 12th, when they sailed to disembark the coolies at Gabriel Island, where cholera broke out almost immediately, most probably from the immigrants opening out infected articles; for they were virtually, at first, in the open air, without tents. There is no water on the island. On the 17th, three days after their landing, the medical man sent to take charge of them found two cases of cholera. The disease spread rapidly, proving itself a fresh epidemic, by its ravages. 271, of 692 landed, died on the island, of cholera and other diseases. 83, only, were admitted to be of cholera, which may be doubled; the rest of the mortality was ascribed to dysentery, fever, &c.

The quarantine arrangements were very defective, and were notoriously violated in several instances—*e.g.* :—

1. Two persons were sent from Flat Island to Mauritius during quarantine (Flat adjoins Gabriel Island and furnishes it with water).

2. A workman left Flat Island for Grand Bay, and thence to Port Louis.

3. The effects of a French surgeon were sent from Flat Island to Port Louis.

A fatal case of cholera, the first of the island mortality, took place on board a steamer, which had gone to the islands with stores, on the 26th February. He had been employed in landing provisions. The steamer came into harbour as if nothing had happened. The crew (40) dispersed through the town, though put into quarantine next day; and a few days later—March 3rd—cholera began on the island, and was epidemic from the 12th.

The progress in the districts is not given with the same detail as in 1854, but at p. 104 I find Dr. Clerehew stating that :—" A part of the district of Savanne was affected at the very beginning of the epidemic, the disease being evidently introduced into the district by a prisoner who went down from Port Louis, and was seized with cholera on the road. On his arrival in Savanne the disease spread to those in contact with him."

He also says :—" Several of the public establishments which suffered most severely from the disease in 1854, have, on this occasion, almost escaped. For example, the prison of Port Louis, which was, in 1854, the principal focus of the disease, has been, on this occasion, almost free from it. This may be partly attributable to the night soil being now

removed by the Inodore Company, and not, as formerly, by the sewers, which are now clean and empty."

The facts which I have adduced tend to give support to the following views :—

1. That cholera is not due to atmospheric or telluric influences, nor susceptible of spontaneous origin from bad local sanitary conditions.

2. But is due to a contagion, transportable from place to place, namely, by human intercourse, or by clothing, or other articles infected by persons ill of the disease.

3. That when the disease appears in a vessel some time after leaving port, it is probable that the contagion hss arisen from exposing some articles of clothing, and which had previously been kept closed from the air.

4. That personal infection takes place under favourable conditions of overcrowding, and with a very short period of latency, and may be presumed to be most common mode when the disease appears on embarkation, or immediately after.

5. That the running water seems to be a powerful agent in carrying the contagion of disease.

6. That drought following cholera may, by contaminating the subsoil water, give rise to secondary epidemics.

7. That previous exposure to cholera influence seems to diminish susceptibility to the disease.

8. That race, under otherwise similar conditions, shows a varying susceptibility, which may, perhaps, be the result, partially, of No. 7.— *October* 24, 1866.

IN the Summer of 1864 I made some investigations respecting the corpuscles of the blood. Although I had not the opportunity, during the present Summer, of continuing these investigations, it seems not inappropriate now to make known some of their results. But observations on this subject, examined by so many, yet still but little known, now rise again from various quarters. May the veil which still covers so much be raised. Perhaps the following may contribute something to this end.

I. *Cell-forms in the Blood of the Adult Frog.*—The development of the blood corpuscles in the adult frog is a much-disputed point. Although it is at present tolerably generally admitted that the lymph corpuscles are converted into blood corpuscles, there is still diversity of opinion as to the intermediate forms. In proof of this I may mention two observers, Rindfleisch and Kneuttinger, both of whom have recently dealt with this question. The former assumes a gradual growth of the lymph corpuscles, and sees the transition forms without trouble ;[a] the latter finds in all other cell-forms the transition states, and calls the observation of them very difficult.[b] The cell-forms indicated by Kneuttinger as such, are, however, by Donders and Moleschott considered as blood corpuscles in process of solution ;[c] while, finally, Henle cannot find the intermediate forms observed by Rindfleisch.[d] Kneuttinger does not even speak of the possibility of Donders and Moleschott being right, as he simply does not mention the idea of these physiologists : I am not aware that it has been refuted. My object is to direct attention afresh to this theory, before doing which it will be well to recapitulate the cell forms which have been observed.

The blood may be considered as a tissue, with movable fundamental forms. This mobility is the cause why forms of all periods are mixed with one another, so that their position does not, as elsewhere, afford an indication of the course of development.

It is, therefore, not surprising that the explanation of the cell-forms met with has been different.

A. *Red Blood Corpuscles.*—Although this term comprises too much, and is so far incorrect, it is difficult to find another. I refer to the red blood corpuscles, κατ' ἐξοχήν, which constitute by far the greatest number of the cell-forms occurring in the blood; only a very small proportion of red corpuscles belong to a kind to be mentioned presently. Those which now occupy us are elliptical, flat, and present a depression on both surfaces. Their magnitude is, according to Welcker : length, 22·3 mmm. ;[e] breadth, 15·7 mmm. ; thickness, 3·6 mmm. Their colour is bright red. No nucleus is distinguishable in blood corpuscles examined immediately after they are taken from the animal, but after some time a nucleus exhibits itself, and is then elliptical. The existence of a membrane is admitted by many and denied by many. No granules are perceptible in the cell.

[a] Experimental-Studien über die Histologie des Blutes, 1863, p. 1.
[b] Zur Histiologie des Blutes, 1865, p. 10.
[c] Holländische Beiträge, 1848, i., 368.
[d] Jahresbericht für 1863.
[e] The reader will please observe that the letters mmm. signify the millionth part of the metre, or the thousandth part of the millimetre. This unit is usually employed by writers on physical optics, and in designating microscopic measurements.—*Translator.*

B. Colourless Blood Corpuscles.—This name has given rise to much confusion, totally different cell forms, which agreed only in the absence of a definite colour, having been indicated by it. Henle made a distinction by separating the fat globules (chyle granules), free nuclei, and immature cells from the lymph corpuscles.[a] Wharton Jones went farther, by again dividing the lymph corpuscles: the most recent investigations have shown the correctness of this. We must, in the frog, distinguish the cell forms which have been designated colourless, as—

1. *Lymph Corpuscles.*—These are the amyloid corpuscles of Rindfleisch, the finely granular cells of Wharton Jones,[b] the greater part of the granular cells of Donders and Moleschott. These cells get into the circulation from the lymphatic system; their number is tolerably great. Donders and Moleschott found that in eight red blood corpuscles one of these cells occurs,[c] but they do not yet distinguish the granular cell from the lymph corpuscles. Rindfleisch obtains about the same result;[d] in 240 red corpuscles he finds 30 colourless; 26 of these last belong to the granular cells of Donders and Moleschott, so that the proportion is 1 : 9; for the amyloid it is 1 : 10. According to Kneuttinger,[e] Rindfleisch found the proportion to be as 1 : 8. On what grounds he asserts this I cannot see: the magnitude of these corpuscles is about 8 mmm. Their appearance is turbid, as it were cloudy, without distinct separate granules. The form of the cells, when lying at rest, is somewhat elliptical. They occur, for the most part, coherent in little heaps. No membrane is present; little molecules are crowded within the corpuscles. A nucleus becomes evident on the addition of acetic acid; it fills nearly the whole cell; sometimes a few little granules are met with. In all movements are observable, not unlike those of the rhizopodes (amœba), whence the name.

2. *Granular Cells.*—This name, given by Rindfleisch, is, perhaps, less happy on account of the different ideas attached to it. They are the coarsely-granular cells of Wharton Jones, a small section of the granular cells of Donders and Moleschott, the granular cells of Moleschott.[f] Ecker does not distinguish these in the frog, although he represents them in some vertebrate animals;[g] his cell with granules,[h] as well as those of Kölliker and Preyer,[i] is a form which is not met with in normal blood. Rindfleisch finds 2 of these in 240 coloured cells. Their magnitude is 12-14 mmm.; they are filled with a number of granules. Their form is round, with sharp contours, which in particular at once distinguishes these from the former ones; they occur in an isolated state. There is no

[a] Anatomie, p. 471.
[b] Philosophical Transactions of the Royal Society of London, 1846, i., p. 68.
[c] Holl. Beitr., i., 367.   [d] Experimental Studien, p. 21.
[e] Zur Histiologie des Blutes, p. 10.   [f] Müller's Archiv, p 13.
[g] Icones iii., Fig. ix. *d.*, Fig. x. *d.*   [h] Icones vi., Fig. xi. *a.*
[i] Virchow's Archiv, xxx., Tab. xv., Fig. 5.

membrane. Acetic acid brings one or more nuclei into view; these fill only a part of the cell. The movements, which are observed also in these, are much more extensive than in the above. Valentin's amöeba in the blood is a moving granular cell.[a]

In frogs, kept long without food, we find both smaller granular cells and cells agreeing in magnitude with granular cells, but otherwise presenting the appearance of lymph corpuscles; it is then very difficult to distinguish them. The difference in movement of the two sorts of cells, such as Wharton Jones has already described, does not exist in the forms mentioned. This would lead one to suspect that the difference in the extent of the movement is dependent on the magnitude of the part of the cell existing around the nucleus—in other words, on the size of the protoplasm.

Ecker distinguishes, as I have already said, the granular cell in other vertebrate animals with nucleated red-blood corpuscles. Leydig[b] distinguishes these decidedly from the lymph corpuscles in the blood of the selachii; Erb makes the same distinction in the hen.[c] The latter I can confirm; and I may add, that, in the embryos of fowl of about fourteen days, both cell-forms, lymph corpuscle and granular cell, have been seen by me. Remak saw the latter cell in an embryo of sixteen days, without making the distinction mentioned.[d]

3. *Free Nuclei.*—These are distinguished by Henle from the colourless, that is, the lymph corpuscles.[e] Wharton Jones saw these, but he did not look upon them as free nuclei. Donders and Moleschott found the free nuclei in the blood of frogs kept for a long time without food, but none in that of those that were well fed.[f]

Rindfleisch believes that these occur constantly, which Kneuttinger also considers proved. Ecker assumes the existence of the nuclei, but those he calls such are lymph corpuscles; in the frog he represents none. It is not difficult to observe their occurrence in fasting frogs. Their form is round, with a sharp contour; their magnitude is less than that of the lymph corpuscles. Their appearance is dark cloudy. Most of them remain unchanged on the addition of acetic acid; only in some does a substance become visible.[g] Wharton Jones also represents something like the nucleus. It is not always possible to distinguish these from lymph corpuscles at rest or dead.

C. Nucleated Cells.—Under the name of pale nucleated cells, Donders and Moleschott, in their frequently-quoted investigations, directed attention to faintly-coloured and partly colourless blood corpuscles; to them they refer a series of cells which are arranged by others under the head both

[a] Müller's Archiv, 1841, p. 435. [b] Vergleichende Histiol., p. 449.
[c] Virchow's Archiv, xxxiv., p. 146. [d] Müller's Arch., 1858, Pl. viii., Fig. 13 *x.*
   Anatomie, p. 470. [f] Phil. Trans., Pl. i., Frog, Fig. 3.
[g] Rindfleisch, Exp. Studien, p. 23.

of coloured and colourless cells. The name nucleated cells expresses the character of this group ; some are as much coloured as the red-blood corpuscles ; these we can, therefore, not call pale. Each of these cells possesses a nucleus which in the blood just taken from the animal is distinctly visible, and has a round form. As even those who do not admit the existence of a nucleus in the red corpuscles cannot deny its presence in this group, the name need not be rejected by them. But that we have no right from these cells to infer the existence of a nucleus in the red cells, as Kneuttinger does,[a] is evident, for they are cells of another period. From Kneuttinger's point of view they are young cells ; the nucleus might then, just as in epidermis cells, disappear.

To this group belong the colourless nucleated cells and the transitions between these and the coloured nucleated cells of Wharton Jones. The nucleus is round, as large as the free nucleus. The following cell-forms must be distinguished :—

1. *Red Nucleated Cells.*—Under the name of " young blood corpuscle," Ecker represents an oval corpuscle,[b] with normal red colour and round nucleus, in which water is said to produce a granular precipitate. These blood corpuscles had been before spoken of, but Ecker has more definitely directed attention to them. Nasse knew these cells.[c] Preyer also announced their occurrence.[d] These cells have been by many brought forward as proofs that the nucleus of the blood corpuscles actually exists, as they observed in them a nucleus in the blood while still circulating, as Wedemeyer,[e] H. Meyer,[f] Kölliker,[g] and, recently, Kneuttinger ;[h] for Wedemeyer, however, who first doubted the existence of the nucleus, this proof is not convincing. Beale's old red blood corpuscles appear also to belong to this category.[i]

The name young blood corpuscles is not happy, as it answers the question, what these forms are ; and it is the less happy, as the answer is probably entirely incorrect.

Preyer[k] saw motor phenomena in these cells in extravasations, in which they are very numerous ; these movements consisted in constant cutting off of round particles of various sizes, which finally caused the annihilation of the cell. We not unfrequently see a change in the form of these cells in circulating blood brought under the microscope.

2. *Colourless and Faintly-coloured Nucleated Cells.*—These are round nuclei, surrounded by a pale, scarcely visible oval, sometimes round contour. The contour of the faintly-coloured cells is easily perceptible.

[a] *Op. cit.,* p. 9.   [b] Icones, Tab. iii., Fig. xi.
[e] Wagner's Handwörterbuch der Physiologie i., p. 196.
[d] Virchow's Archiv, xxx., p. 435.
[c] Meckel's Archiv, 1828.   [f] Müller's Archiv, 1843, p. 208.
[g] Microcopische Anatomie, ii., p. 583.   [h] *Op. cit.,* p. 9.
[i] Medical Times and Gazette, 1865, April, p. 330.
[k] *Op. cit.,* p. 426.

Wharton Jones first described these. Donders and Moleschott, and subsequently Cramer,[a] confirmed their existence. Rindfleisch did not observe these cells in the frog.[b] In the triton they were, according to him, tolerably numerous. They are very numerous in frogs who have fasted long; at first only the nuclei are seen; after some moments, however, the cell contours become distinct.

3. *Pale Blood Corpuscles.*—Under this name Hensen[c] directs attention to faintly-coloured blood cells, which were by him considered to be the same as the "nucleated cells, uncoloured stage" of Wharton Jones, as the pale nucleated cells of Donders and Moleschott, and as the young blood corpuscles of Ecker. But this is incorrect. Even the name would be in all cases badly chosen: thus the first-named are colourless, the last-named are almost as highly coloured as the normal, while the intermediate cells are both coloured and not coloured. Hensen observed in this cell-form protoplasm rays, which are found around the nucleus; these rays are met with in none of the cell-forms spoken of, but are found in blood corpuscles, which are of a very pale yellow colour, and have notched margins. We find these, although in small number, in starved frogs.

D. Transition forms between Lymph Corpuscles and Red-blood Corpuscles.— Rindfleisch has anew directed attention to these cell-forms. They had been seen before, but had apparently been forgotten. Henle could not see them last year.[d] Schultz, Wagner, Nasse,[e] H. Müller,[f] Frey,[g] mention these cells, and probably Henle's immature blood corpuscles, with pale periphery (rind) closely surrounding the nucleus must also be referred to this category. Beale, too, has recognized and represented definite transition forms.[h]

We find these cell-forms only in well-fed frogs, which have spent a very short time—one or two days—in captivity; later they have nearly entirely disappeared. This rapid disappearance, by Rindfleisch especially placed in the foreground, is perhaps the cause why many could not see the cells. In very young cells the nucleus is seen, not in others. It is as if a periphery arises around the lymph corpuscle, which becomes larger and larger, the lymph corpuscle thus appearing as nucleus. This hypothesis, formerly put forward by Nasse,[i] and subsequently given up,[j] is, as it seems to me, most in accordance with these cell forms.

Let us now consider the hypothesis of Donders and Moleschott. These physiologists examined the blood of frogs which had been kept without

[a] Müller's Archiv, 1848, p. 65.   [b] *Op. cit.*, p. 24.
[c] Zeitschrift für wissensch. Zoölogie, herausgegeben van v. Siebold und Kölliker xi., p. 264.   [d] Jahresbericht für 1863.   [e] *Op. cit.*, p. 196.
[f] Zeitschrift für rationelle Medicin, 1845, p. 271.
[g] Histiologie und Histiochemie, p. 168.
[h] *Loc. cit.*, p. 330.
Wagner's Handwörterbuch der Physiologie, i., p. 196.   [j] *Op. cit.*, ii., p. 394.

food for various periods. They found, besides the red blood corpuscles a number of nucleated cells and free nuclei, and the latter especially in greater number the longer the animal had been without food. Therefore they correctly look upon these nucleated cells as blood corpuscles in a state of retrogression, and of which, at last, the periphery disappears, leaving only the nucleus. In this view Rindfleisch also coincides, without mentioning the names of the above two physiologists,[a] although he assumes another mode of destruction of the red blood corpuscles.[b] The blood corpuscles passing into solution occur in very small number in the well fed frog, in which we meet also with very many forms of development. After some days the last disappear, while the first occur more and more abundantly. Thus Donders and Moleschott found many nucleated cells in frogs which had fasted in the course of the Summer for twenty-two days, very many in frogs in February and March. The nuclei of these cells resemble the free nuclei. The latter are here also much more numerous than in the blood of well-fed fcogs. They exhibit no contractility, and are, so far as is known, capable of no further development.

Did we wish to look upon the nucleated cells just described as young blood corpuscles, as has been done by many—Wharton Jones, Ecker, Kneuttinger—we should encounter many difficulties. We cannot assume two wholly different transition forms : if, therefore, we indicate those described under *D* as forms in a state of development, we must ascribe another signification to the nucleated cells. If we further take into account that the nucleated cells occur very sparingly in well-fed animals and very abundantly in the badly-fed, we should, on another hypothesis have the strange phenomenon before us that the development of the cells had taken place more rapidly when food was withheld than when it was copiously supplied. That this does not accord with what we know of the development of the blood corpuscles in the mammalia, nor with the development of tissues in general, needs no proof. In extravasation we see many nucleated cells produced, and in these we will not assume any development of blood corpuscles.

Round, Dark-coloured Blood Corpuscles.—One form of blood corpuscles remains which I have not yet mentioned. As I believe that they do not occur in blood examined immediately after it is drawn from the vessel I mention them after all the others. They have been made more generally known by Donders and Moleschott, who described them as round, glittering, dark-coloured forms, long resisting the action of water.[c] Nasse had previously seen them, and given them the name of non-nucleated cells.[d] H. Meyer describes, in the triton, small, dark-coloured blood corpuscles, with a nucleus scarcely or not at all visible.[e] Whether Ecker

[a] *Op. cit.*. p. 24.   [b] *Op. cit,* p. 42.
[c] *Op. cit.,* p. 363.   [d] *Op. cit.,* p. 196.   [e] Müller's Archiv, 1843, p. 206.

has seen these in the spleen, it is, in the different cell-forms mentioned by him, not possible to say with certainty.[a]   Funke did not find these corpuscles in blood examined immediately, but observed that they form in the preparation under the microscope.   He assumes a nucleus in them, for he says that the empty cell envelope remains ; the nucleus must, therefore, be concealed in the " cone of colouring matter," as he calls these corpuscles.[b] Rindfleisch, in 1863, brought these corpuscles again under notice.[c]   Preyer[d] and Kneuttinger[e] also mention them.   Preyer differs from most of the writers above named, as he does not observe these corpuscles constantly in each drop of blood.   The colour he calls blood-green.   Some did not find a nucleus; others did.   Preyer, in perfectly analogous forms in extravasated blood, saw that the nucleus was sometimes absent, sometimes present.

Whether these corpuscles occur perhaps in the Spring, after the animals have for some months suffered hunger, I am not aware.   Now, in December, after a couple of months fasting, they are not yet met with.   But they are produced, as Funke correctly remarked, in drawn blood, under the covering glass.   That the cause of the occurrence of these forms is not the access of air nor evaporation of water is proved by the red blood corpuscles, whose nucleus is not yet visible, when these round corpuscles have already arisen.

Donders and Moleschott considered these corpuscles, on account of the absence of the nucleus and their diminution during fasting, as more highly-developed blood corpuscles, as homologues of the blood corpuscles of the mammalia.   The later observers above named look upon them, on the contrary, as parts of red blood corpuscles in process of annihilation.   In this view we must agree, particularly as these have been found also in extravasated blood, and their origin has been directly observed by Preyer, who saw them dividing into smaller and smaller particles.   These round corpuscles possess, however, the power of altering their form, so that they cannot be mere drops of colouring matter, but must possess protoplasm.   In frogs which had during the Summer been long kept confined, I observed different changes of form in these corpuscles ; long, partly coloured, partly colourless prolongations took place, which were subsequently again drawn in ; these prolongations sometimes exceeded the coloured blood corpuscles in length.   The want of agreement respecting the presence of the nucleus is strange.   Kneuttinger, to whom the results of Rindfleisch, who found a nucleus, were known, found none; and as such observers as Donders and Moleschott could find none, we may safely look upon this as correct. Probably different varieties are still hidden among them.

[a] Zeitschrift für ration. Medicin, vi., p.
[b] Atlas der phys. Chemie., Tab. xii., Fig. 4.
[c] *Op. cit.,* p. 2.   [d] Virchow's Archiv, xxx., p. 425.   [e] *Op. cit.,* p. 11.

PLATE 1.

Fig. 1.
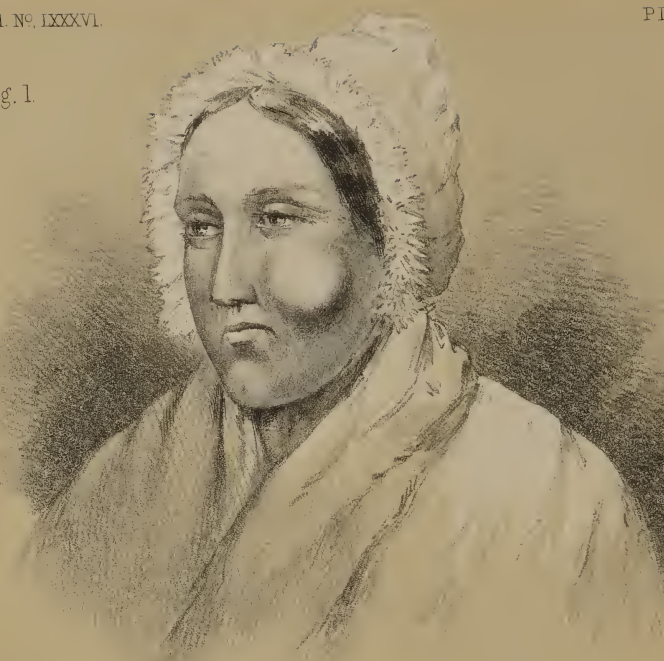
Fig. 2.
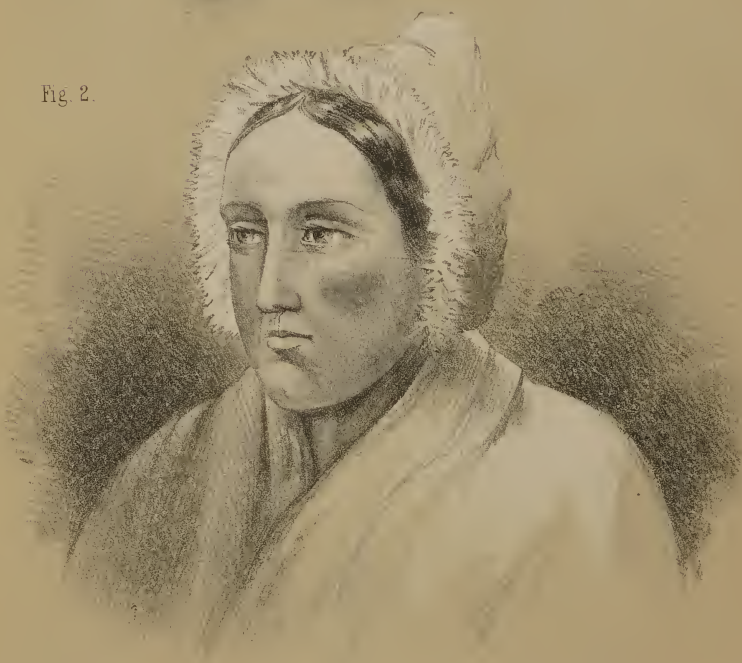
M^R PORTER ON EXCISION OF THE UPPER JAW.

PART I.

ORIGINAL COMMUNICATIONS.

ART. XII.—*Surgical Reports.* By GEORGE H. PORTER, M.D.,
Univ. Dub.; F.R.C.S.I., Senior Surgeon to the Meath Hospital
and County of Dublin Infirmary ; Surgeon to Simpson's
Hospital ; Examiner in Surgery Royal College of Surgeons,
Ireland ; Consulting Surgeon to the Coombe Lying-in Hospital ;
Member of Council of the Surgical Society of Ireland, and of
the Pathological Society of Dublin ; Lecturer on Clinical
Surgery.

I.—EXCISION OF A LARGE PORTION OF THE UPPER-JAW FOR
EPULOID DISEASE ; RECOVERY.

II.—COMPLETE EXCISION OF THE ELBOW-JOINT FOR STRUMOUS
DISEASE ; RECOVERY.

III.—EXCISION OF A LARGE-SIZED EPULIS SPRINGING FROM THE
LOWER-JAW ; RECOVERY.

1.—*Excision of a Large Portion of the Upper-Jaw for Epuloid
Disease; Recovery.*

In every operation in any degree implicating the human face it
must ever be desirable, as much as possible, to guard against the

production of subsequent deformity.   The removal of an unsightly tumour of the jaw-bone, which distorted the soft parts of the face covering the swelling, is a great benefit; but in accomplishing this the prevention of disfigurement, by cicatrices of those structures, is of the utmost importance.   Among those eminent men who, by their valuable suggestions, have aided the operator in excising the upper jaw, or portions of it, Sir William Fergusson holds a foremost position.   Various incisions to lay bare growths from the superior maxilla have been recommended, all of them most useful in the cases to which they are immediately applicable, and tending to assist the surgeon in dealing with such tumours. I believe, however, that in the majority of instances, a small amount of cutting into the soft parts will suffice to allow the excision of a large portion of the upper-jaw. The following case, I consider, proves, in a very marked way, the advantages of the simple incision practised by the distinguished surgeon before mentioned in removing tumours of a moderate, and even of a large size from the upper-jaw. The trifling incision made vertically through the centre of the upper-lip, and prolonged into one or both nostrils, affords space enough to remove most of ordinary tumours of the superior maxilla, and leaves very little trace, or slight disfigurement behind. Great stress is laid upon the advantages of this incision by Sir William Fergusson, in the following quotation, which I take from one of his lectures (No. IV.), delivered at the Royal College of Surgeons, London, in 1865, on the " Progress of Surgery during the present Century." He says:—
" There are two advantages of great importance, in my opinion, associated with this incision.   First, the wound being made in the furrow below the columna, and exactly in the middle of the lip, is less observable than on any other part ; and next, there is an inch in length gained by the natural opening of the nostril.   The ala of the nose is so easily raised, and with the tip can be so easily moved according to the will and wish of the operator, and the cheek can be so readily dissected off the tumour as high as the margin of the orbit, and as far out as the malar bone, that a large space for operation on the anterior surface of the maxilla is easily made.   Since 1848 I have never made any other incision in the upper-lip ; and I have no hesitation in stating, from experience of twenty cases or more, that in a number of operations of moderate-sized tumours there is no need for more extensive incisions on the outer surface of the face."

Bessy G., aged forty years, married, was sent to me by my friend

Dr. L'Estrange, of Dublin, and admitted into the Meath Hospital, August 10th, 1867. Her health appeared to be good; she was not wasted, nor did she complain of pain. Her left cheek was visibly swollen and distorted, and a well-defined tumour, of a somewhat globular shape, appeared about its centre, but still the deformity was not very great, She stated that the growth was of nearly three years' duration, but latterly had commenced to increase very rapidly. On opening the mouth a tumour about the size of a hen's egg came into view. Its surface was smooth, with the exception of a speck of ulceration, about the size of a three-penny piece, in the centre of its most prominent point. It was almost globular, but slightly longer from before backwards. The two incisor, and the last molar teeth were all that remained on that side of the upper-jaw. The colour of the tumour was a little deeper than that of the healthy gum structure. To the touch it was very firm, but not of a stony hardness, nor was it nodulated. It had never bled. It extended half way in on the roof of the mouth. The patient found some difficulty in masticating, and her voice was a little interfered with. The left nostril was quite free, and there was no glandular enlargement to be found anywhere. As there was no evidence whatever of malignancy, and having had the advice of my colleagues, I determined to excise the growth. To this she at once assented, as she had come into the hospital for that purpose.

Operation, August 22nd.—I excised the tumour in the following manner:—She was placed sitting in a strong chair, which was then gently thrown backward, so as to put her in a semi-reclining position, whilst chloroform was carefully administered. This having been accomplished, Dr. L'Estrange extracted the two left incisor teeth in a most expert manner. My assistants then raised the chair, so as to bring her again to an almost erect sitting posture, the head slightly drawn backwards, and held firmly. I then, with a medium-sized scalpel, quickly cut through the upper lip, exactly in the median line, and immediately afterwards carried the incision into the left nostril. A colleague then seized the opposite flap, whilst I held the one on the diseased side, so that bleeding from the coronary arteries was arrested. This amount of cutting, combined with traction made on the cheek by means of a copper retractor, brought a great portion of the abnormal growth into view. Keeping the knife close to the bone, I cleared the soft structures from the maxilla fairly above, and isolated the tumour superiorly to about a quarter of an inch below the infra-orbital

foramen. A small vessel sprang during this dissection, which was easily secured. I then cut through the mucous membrane of the hard palate from behind forwards, and through.the gum tissue in front, so as to make a groove for a strong cutting bone forceps, one blade of which I inserted into the left nostril, and the second into the mouth, and rapidly cut through the palate plate. With the little saw (somewhat resembling Hey's, but known as Sir William Fergusson's), I proceeded to cut through the front and side of the superior maxillary bone, about midway between the infra-orbital foramen and the alveolar process. Grasping the mass with a strong lion forceps, I forcibly depressed the tumour with the adherent bone, breaking down attachments behind, and wrenching the entire from its bed. A few more touches of the knife to soft parts which held it allowed me to remove the whole tumour. I now cleaned out the mouth and wound with sponges; and finding a bleeding point in the bone, I touched it with a small red-hot iron, which arrested all hemorrhage. The cavity was now filled with four little pads of lint, having strings attached. The sides of the wound in the lip I brought accurately together by means of two needles with twisted sutures, and one point of inter-rupted silver wire suture in the red part of the lip. The three cords attached to the plugs of lint which filled up the cavity, along with the ligature, were brought out at the left commissure of the mouth, and fastened to the cheek by a small piece of adhesive plaster. A narrow strip of this plaster was then placed over the wound to relieve tension on the sutures, and more effectually to support the parts. The patient was then removed to bed, and a draught, con-taining twenty-five drops of Battley's liquor of opium, was adminis-tered. Some beef-tea was ordered during the day, and it was directed that the mouth should be washed out with iced water.

August 23rd.—The patient slept well ; the cheek was slightly swollen, but she suffered no pain, unless when she swallowed ; pulse, 96 ; beef-tea ordered, with crumb of bread softened in it.

August 24th.—Had passed a good night ; the swelling in her face was less, and her pulse had fallen to 90.

August 25th.—She was better to-day. The needles were removed, also the wire suture, and the wound was found to be firmly united throughout. Suppuration was established in the former site of the tumour, and she complained of a disagreeable odour from the discharge. One of the plugs was then removed, and she was directed to wash her mouth with a lotion consisting of

PLATE III.

MR. PORTER ON EXCISION OF THE ELBOW JOINT.

one drachm of solution of chlorinated soda, in half a pint of water.

August 26th.—The remaining plugs were removed, and on looking into the mouth the sore part looked healthy and granulating.

It would be useless to further note the daily report of the case. The ligature came away on 31st of August, and she progressed steadily from day to day, leaving the hospital, cured, on the 7th September, just sixteen days after undergoing the operation. In the drawings taken before and after this operation, Plate I., Fig. 1, faithfully shows her appearance before the operation, and Fig. 2, her condition after it. The trifling mark which remained from the incision through the upper lip is a palpable proof of the advantages of this mode of dealing with such a case, and its whole management shows very clearly that a large amount of disease extensively implicating the superior maxilla, may be removed with ease by this simple incision. Dr. John Barker, the distinguished curator of the Museum of the Royal College of Surgeons, kindly examined the growth, and favoured me with the following description:—

"83, Waterloo Road,
"August 31, 1866.

"My Dear Porter,—The specimen you gave me appears to be one of epuloid growth. I examined it carefully under a power of about 400 diameters, and it presented the aspect mentioned by Paget as appertaining to fibrous epulis, with a gelatinous base. Many of the fibrous bands are curled and elastic; and although in some portions of the tissue they appear knotted, and in other parts dilated into cells, still the mass has a very uniform character. I do not think the cells have that independent appearance so characteristic of malignant disease. The specimen swelled up very much under the staining process, and became more gelatinous, the colour principally resting in the fibrous bands, giving evidence that these were the latest formed materials.

"I remain yours,
"Very truly,
"John Barker.

"Geo. Porter, M.D."

2.—*Complete Excision of the Elbow-joint for Strumous Disease; Recovery.*

In the *Dublin Quarterly Journal* for November, 1860, I published

a case of resection of the elbow-joint for compound fracture, the
result of which was most successful, as the man operated upon,
who was a painter by trade, was afterwards enabled to use that
limb at his wonted employment.   The following case was one in
which the operation was performed under much more unfavourable
circumstances, the constitution of the patient having been debili-
tated by scrofulous disease of the tibia, for which the late Mr.
Smyly had amputated her left leg below the knee, on the 4th
November, 1863:—

Julia D., aged thirteen years, was admitted into the Meath
Hospital the 21st August, 1866.   She was a very delicate child.
Her right elbow joint was much swollen and stiff, and the seat of
constant excruciating pain.   She suffered also from nocturnal sweats.
The posterior aspect of the articulation was occupied by a large
unhealthy ulcer, from which a sinus led inwards to diseased bone
in the immediate neighbourhood of the joint.   Symptoms of disease
had been present for two years; and the forearm and hand having
been rendered useless, it was determined to cut down and remove the
diseased bones.

September 26th.—She was laid on the operating table, and having
been thoroughly chloroformed my assistant held the limb in a
prone position, and at the same time so grasped it as to command
the brachial artery.   The precaution, however, was hardly requisite,
as severe hemorrhage seldom occurs during this operation, the part
of the limb to be opened being away from vessels of magnitude.

With a strong scalpel I made a longitudinal incision four inches
in length along the back of the joint in the middle line, part of it
passing through the ulcerated structures.   I then made a second
incision from the external condyle, so as to meet the first.   The
flaps thus cut were carefully dissected up, and the lateral ligaments,
or at least such portions of them as remained, were divided, and the
tendon of the triceps severed.   My assistant then forcibly flexed
the joint, and brought its diseased interior fairly into view.   I
then, chiefly with the handle of my knife, cleared the soft parts from
the extremities of the bones, separating them with more care on the
inside to avoid injury to the ulnar nerve.   Having accomplished
this I placed the reversed blade of Butcher's saw in front and
above the condyle of the humerus, and rapidly cut through the bone
towards myself.   This section appeared redder and softer than I
liked; I therefore cut off a second slice of bone, which revealed to
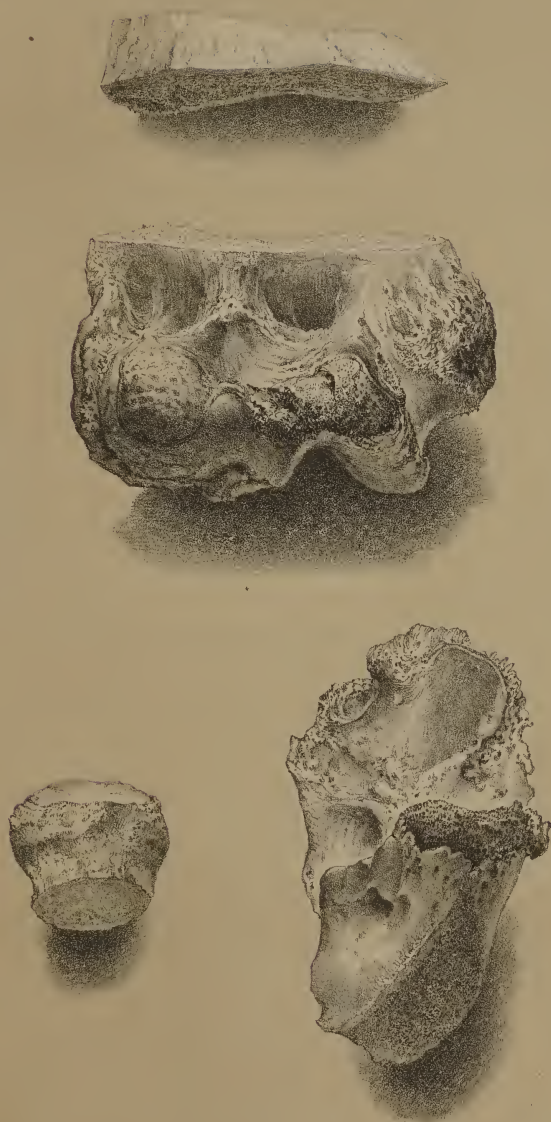
M^R PORTER ON EXCISION OF THE ELBOW JOINT.

view healthy osseous structure. I sawed off the olecranon and coronoid processes of the ulna, and the head of the radius in the same manner. With a strong pair of scissors I then pared away any thickened structures about the joint, and having tied three small vessels, I immediately washed out the wound by pouring into it cold water from a height, and introduced four points of silver wire suture to approximate the flaps, dressing the wound with strips of lint wet with spirit lotion. I gently flexed the forearm to a right angle, and placed the limb, carefully bandaged, on a well-padded rectangular wire splint. The patient was forthwith put to bed, and got an opiate.

The daily record of the case does not present any peculiarity. Passive motion was commenced about sixteen days after the operation, and increased gradually so as to ensure the formation of a false joint. The girl now possesses great command over the motions of the forearm and hand; she can supinate and pronate, flex and extend, the forearm, and can use her fingers sewing.

On examination of the portions of bone which had been removed, it was found that the cartilage had disappeared from part of the trochlear surface of the humerus, and had been replaced by fungous granulations, the greater sigmoid cavity having been almost filled up with a gelatinous fleshy mass; the coronoid and olecranon processes were denuded of periosteum and covered with spiculated bony projections; the head of the radius, at its articulation with the humerus, was diseased, the radio-ulnar joint alone remaining sound.

Plate II. gives a faithful representation of the different portions exsected. Two inches and a half of bone were removed. The primary incision which I adopted in the present case, as well as that in which the excision was performed for compound fracture, was one which gave ample room for the exposure of the articulating ends of the bones about to be removed. Different operators of eminence, however, recommend various preparatory incisions; as, for example, the H-shaped incision — Moreau, Fergusson, and Syme. The single vertical is recommended by Park, Chassaignac, and Langenbeck; the crucial by Park, Fergusson; the semi-lunar by Gross. All these methods have their respective advocates. Syme, to whom much is due for bringing this operation to perfection, in his *Observations in Clinical Surgery*, speaks highly of the H-shaped. He says:—" This incision I still regard as the most convenient for the purpose, since it not only affords free access to the joint, but also allows the transverse part of the wound to heal

by the first intention, and thus prevent the obstacle to mobility which would result from the process of granulation, followed by cicatrization at this part." The form of cut adopted in this case will, I feel confident, be found amply sufficient and convenient. The advantages of this operation as a conservative measure require in the present day no advocacy, excision of the elbow-joint having been firmly established among the safe and beneficial operations. Whether performed for joint disease, compound fracture, or inconvenient anchylosis, it has been found that the proportion of deaths is very small, amounting to about 22·15 per cent., while amputation through the humerus yields 33·4 per cent. of deaths. Another encouraging circumstance is that this operation is most successful in young patients, among which class it is likely to be more frequently performed from the prevalence of joint disease in early life. The drawing, Plate III., gives a very good representation of the present condition of the limb, which is in every respect a most useful one.

3.—*Excision of a Large-sized Epulis, Springing from the Lower-Jaw; Recovery.*

Cecilia O., aged twenty-nine years, and married, was admitted into the Meath Hospital, under my care, July 16th, 1866, suffering from a large epulis. This woman was in a very weakly condition, having been confined only three weeks previously; and prior to that event, her circumstances being very straitened, she was ill clad and badly nourished. On admission she presented the following symptoms:— Her left lower jaw appeared at first sight greatly swollen, as if from a severe gum-boil. The examination of her mouth, however, displayed a large tumour, occupying the position of the teeth on that side of the inferior maxilla from the second incisor to the last but one molar. Its measurements, taken with a callipers, were one inch and a-half in its transverse diameter, and one inch six-eighths in its antero-posterior diameter. It pushed the tongue towards the right side. Its colour was that of the surrounding gum structure, and its surface was slightly lobulated, giving it a somewhat hour-glass shape. To the touch it felt firm and elastic, like healthy gum tissue. Its upper surface was ulcerated from pressure of the teeth of the upper jaw indenting the growth. The patient was unable to close the teeth in front, a space of half an inch existing between the upper and lower incisors. She suffered pain when she tried to masticate. The only teeth visible on that side were the

incisors and the last molar.   The others had (with the exception of
the first molar) been thrust out by the tumour, which had appa-
rently sprang from the socket of this tooth after its extraction two
years previously.   She did not feel any pain until the ulceration of
its surface commenced, nor had the tumour bled before it ulcerated.
Although wretchedly emaciated and looking feeble, there was no
malignancy in her aspect, so that the absence of glandular contami-
nation, coupled with the length of time it had taken to grow, made
me decide on its removal.   Any operative interference, however, in
her debilitated condition was not to be thought of, so I determined
to bring up her health by generous diet and rest.

On the 10th of August, her strength having very much improved,
I proceeded to excise the tumour in the manner following:—I had
her placed on a low table, with her head and shoulders slightly
raised, and had chloroform administered.   And here I may remark
that although some surgeons have a great objection to the use of
this agent when operating on the mouth, still my colleagues and I
frequently give it in such cases, and never fear an unpleasant result,
provided that any flow of blood is rapidly sponged up as the neces-
sary incisions are proceeded with.   The second incisor was drawn,
and one of my colleagues having inserted a strong copper spatula,
bent to an abrupt curve at its end, into the mouth, he forcibly
dragged the cheek outwards and backwards.   This manœuvre gave
me a good deal of room, but not sufficient to allow me to work with
a saw behind the tumour without splitting the cheek.   The tongue
having been well depressed, I cut downwards through the mucous
membrane inside and outside the jaw, behind the mass, to about the
extent of half an inch from the alveolar process.   I then, with a strong
nippers, the blades of which I placed in the incisions, cut through
the bone to the same depth from the surface of the adveolar process.
I now carried similar incisions through the mucous membrane in
front of the epulis, and cut, with a small saw, to the same depth in
the jaw bone as I had done behind with the nippers.   Having now
isolated the swelling before and posteriorly, I made incisions con-
necting these on the outside and inside through the lining mem-
brane.   Then with the saw I partially cut through the body of the
inferior maxilla beneath the epulis, and completed its entire removal
by means of a strong cross-cutting nippers.   There was very free
hemorrhage from the inferior dental artery, but I carefully plugged
the space with lint, over which I placed a thick compress, and
tightly bandaged the lower-jaw to the upper.   This arrested all

bleeding. At the same time sufficient space was permitted between the front teeth to allow of the patient getting fluids with a spoon. She was then removed to bed, and an opiate administered. On examination the tumour appeared to be a simple epulis. The section of the bone was sound, and the growth had arisen from the sockets of the teeth, and overlapped externally and internally. The above case may be considered interesting, showing, as it does, the feasibility of extirpating a large tumour from the lower maxilla without the infliction of any wound on the face. The epulis itself afforded a larger example of this disease than is usually met with. This poor woman made a good recovery, and left the hospital on the 31st August in excellent health.

ART. XIII.—*Contributions to Operative Surgery.* By HENRY GRAY CROLY, F.R.C.S.I.; Licentiate of the King and Queen's College of Physicians; Surgeon to the City of Dublin Hospital; Lecturer on Clinical Surgery; Senior Demonstrator of Surgical and Descriptive Anatomy in the School of Surgery of the Royal College of Surgeons.

FOUR cases of Amputation by long and short rectangular flaps (Teale's method), illustrated by practical observations advocating this mode of operation, viz:—

I.—AMPUTATION OF THE LOWER THIRD OF THE LEFT THIGH; RECOVERY.

II.—AMPUTATION OF THE ARM; RECOVERY.

III.—AMPUTATION OF THE ARM; RECOVERY.

IV.—AMPUTATION OF THE LOWER THIRD OF THE LEFT THIGH; RECOVERY.

When the surgeon is called upon to amputate a limb the first question which naturally suggests itself to his mind is, by which of the several methods shall I perform the operation? And although the subject is one which, from the earliest history of our noble art, has received a large share of attention from surgical writers, there is, perhaps, none on which surgeons, even in the present day, are more undecided. We find some preferring the old circular method—

PLATE 1.

MR CROLY ON OPERATIVE SURGERY.

others the flap by transfixion. As a student I witnessed many amputations by the circular method and transfixion flaps; and although the results were generally favourable I cannot say that I have seen many stumps which allowed pressure to be applied without causing pain or distress. In the early part of the year 1860, when house-surgeon to the City of Dublin Hospital, I had an opportunity of visiting Leeds professionally. I went, on my arrival, to see the well-known infirmary, where the celebrated Hey performed so many operations. On going round the wards I was attracted by a case of amputation of the thigh, performed a few days previously by Mr. Teale, according to his own peculiar method. The stump was excellent. On having the steps of the operation (now known throughout Europe as "Teale's amputation by long and short rectangular flaps") fully explained to me by Mr. Teale and his son, Mr. T. P. Teale, jun., I was forcibly struck with its advantages over the ordinary mode of amputating.

Mr. Teale (whose kindness and attention during my short visit I can never forget) took much trouble to exhibit the stumps of patients operated on by him, amongst them the boy Waddington (so beautifully photographed in his book, which he kindly presented to me). I returned to Dublin fully impressed with the superiority of this modification of the flap operation, and frequently practised it on the dead subject. In the year 1863, soon after my appointment as Surgeon to the City of Dublin Hospital, a case requiring amputation of the thigh was admitted under my care, and I at once gave preference to the rectangular flap, feeling thoroughly convinced of the many advantages claimed by that distinguished surgeon for his special operation. I have since, on all suitable occasions, performed the same operation, and only rejected it when the soft parts were so injured by machinery or otherwise as to prohibit the rectangular flaps being made without sacrificing too much bone. In the short paper which I now present to the profession on this important and practical question, it is not my intention to decry the circular or flap operations, as I am aware that in certain cases and under peculiar circumstances amputation by those methods may be still successfully practised; but I hope to show those who may be prejudiced against the mode of operating which I now advocate that its disadvantages are few and its advantages numerous.

I shall now detail the history and progress of four interesting cases of amputation, the result of which will prove the success of

this particular operation, and the just preference which it is fast attaining by surgeons in almost every quarter of the globe. And I may here observe that although I was not the first surgeon to perform Teale's amputation in this country, I may venture to take credit to myself for having been the first to introduce the subject to the notice of the profession, as will appear in a subsequent part of this paper.

CASE I.—D. H., a female aged fifty-five years, was admitted into the City of Dublin Hospital on the 10th of October, 1863, suffering from a large ulcer on the left leg. She presented a wretchedly emaciated appearance, had a feeble and rapid pulse; perspired freely at night; had no appetite, and slept very little, even with the assistance of large opiates, which for some months had been prescribed by a physician who attended her. The poor woman stated that the ulcer commenced by a small blister on the calf of her leg, about two years previously; it gradually spread, but was not painful until twelve months ago; it never healed, and now occupies the entire calf of her leg and also part of the front of the limb. The discharge is copious and very fetid. The tibia, I ascertained by manipulation, had been completely eaten through by the ulcer. The patient compared the pain to hot needles darting through her leg. There were no enlarged glands in the groin. She urged me to amputate the limb, but her emaciated appearance and feeble circulation prohibited operative interference at that time. I prescribed a liberal nutritious diet, quinine, opiates, and disinfectant lotions to the ulcer. The poor woman's health improved considerably by this treatment; and on consulting with my surgical colleagues it was decided that she should get the chance of the operation, to which she readily consented. I accordingly proceeded to operate as follows:—

The patient having been placed fully under the influence of chloroform, and the femoral artery controlled by digital pressure, I measured the circumference of the limb at the junction of the middle with the lower third of the thigh, and having doubled the string I marked out with ink, in the presence of my colleagues and a large class of pupils, the anterior rectangular flap, which was the length and breadth of half the circumference of the limb, and the short flap, which equalled one-fourth of the length of the anterior flap.

The lateral incisions were made with a stout scalpel through the

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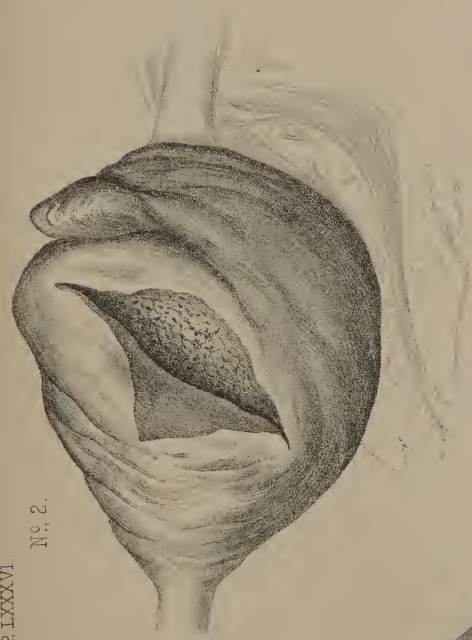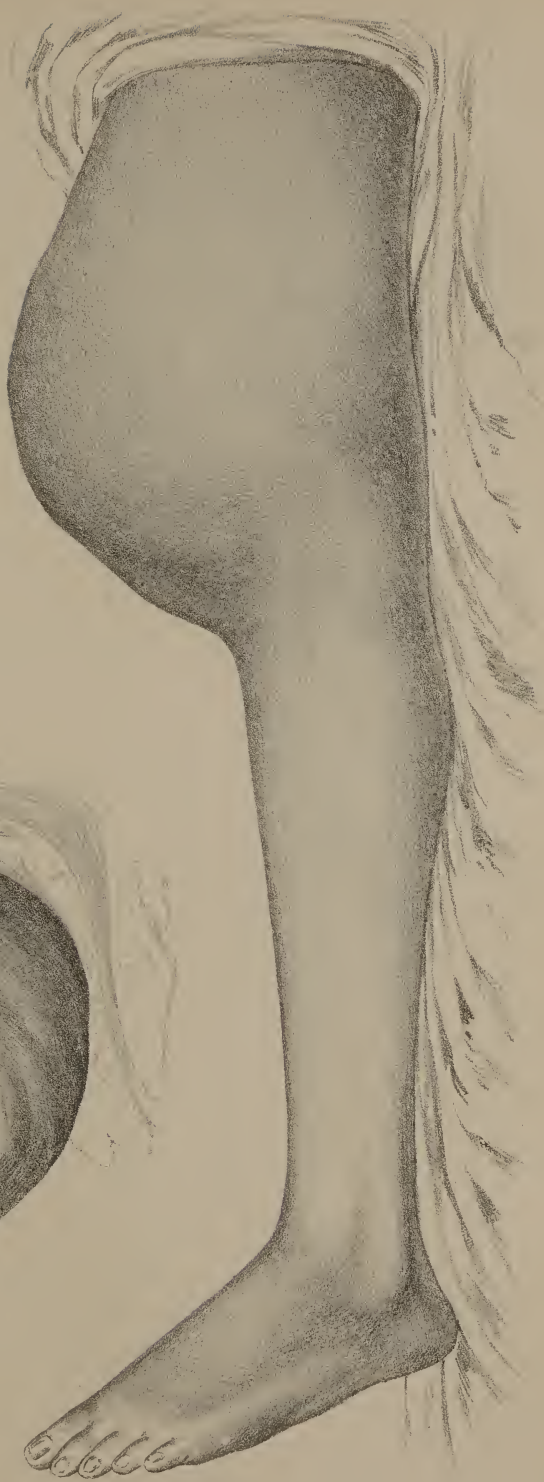
Mᴿ. CROLY ON OPERATIVE SURGERY.

integuments only, and the transverse incision went down to the bone. The long flap, thus mapped out, was rapidly dissected and drawn up by an assistant. I next, with an ordinary circular amputation-knife, made the short flap by cutting, at one sweep, down to the bone, and then dissected the short flap up to the base of the long. A retractor was applied, and the bone sawed. The femoral and profunda arteries and some muscular branches were ligatured. The angles of the long flap were then brought into close approximation with the angles of the short flap and fixed by wire sutures. The lateral incisions were closed in a similar manner. Scarcely any blood was lost. The patient quickly recovered from the chloroform, and was placed comfortably in bed, with the stump resting on a small pillow, covered with oiled silk. No adhesive plaster or bandage was applied. The stump healed by the "first intention." The ligatures separated within a fortnight. I exhibited this patient at a meeting of the Surgical Society, and thus, for the first time, was Teale's amputation brought under the Society's notice.

Case II.—J. H., aged fifteen years, a native of Mountmellick (Queen's County), was admitted into the City of Dublin Hospital on the 6th of May, 1864. He was sent to me by my friend Dr. Clarke, medical officer to the Mountmellick Workhouse fever hospital, &c., who kindly furnished me with the following particulars of the case. He is the son of strumous parents; from childhood he has been affected with struma in the glands of the neck. About five years ago his right elbow became affected; pains were taken to restore it without success. On admission to hospital the elbow presented the appearance (too well known to require description) of extensive scrofulous disease. On consultation with my colleagues it was determined that amputation should be performed. Having placed the patient fully under the influence of chloroform I laid open the joint by the H incision, hoping, if possible, to save his arm, but finding the humerus too much diseased I converted the upper part of the H incision into the long flap of "Teale," and formed the short flap by one sweep of the catlin. The wounds healed by "first intention," and the boy returned home on the 2nd of August (three months after admission), and has since been in the enjoyment of good health, and has a most excellent stump.

Case III.—R. M., aged thirty-three years, was admitted into

the City of Dublin Hospital, under my care, on the 5th of November, 1865, suffering from scrofulous disease of his right elbow-joint. The disease commenced nine months previously. A number of sinuses existed, through which diseased bone could be felt by passing in a probe. It was decided, on consultation, that the arm should be amputated. I performed the operation by Teale's method, and the wound healed with rapidity.

Case IV.—A. M'A., aged nineteen years, a fine country girl, residing in the county of Monaghan, was admitted into the City of Dublin Hospital, under my care, on the 16th December, 1865, suffering from enlargement of the left knee-joint. The girl, who has always enjoyed excellent health, and whose parents, brothers, and sisters, are also healthy, stated that she slipped and fell on her knee eighteen months previously. The joint became swollen, and she was obliged to remain in bed for a fortnight. She was visited by a medical gentleman who blistered her joint. She was not much relieved by that treatment. In the Spring of the past year the knee became painful (especially at the internal side); it was then painted with tincture of iodine. Eight months subsequently the joint was observed to enlarge, and has since gradually increased in size; the limb started occasionally at night. The patient has not been able to walk on the leg for fifteen months.

State on admission to hospital. Left knee-joint much enlarged; the tibia is displaced backwards, the foot and leg appear natural, large veins are observed ramifying over the internal side of the joint, the periosteum of the femur is thickened as high as the junction of the middle with the lower third of the bone, and gradually expands to the joint. On grasping the leg it can be moved laterally with facility; pain is complained of when the tibia is pressed upwards against the femur. The patella is slightly movable, and situated on the lower part of the joint; the swelling on the outside has a hard almost bony feel; and on the inside there is a distinct fluctuation.

The following are the measurements of the diseased and sound joints:—

DISEASED JOINT.

Circumference of thigh at junction of middle with lower third,	-	-	16	inches.
,, ,, immediately above the joint,			$18\frac{1}{4}$	,,
,, across the centre of the patella,		-	$19\frac{3}{4}$	,,
,, below knee-joint,		-	16	,,

SOUND JOINT.

Circumference of thigh at junction of middle with

	lower third,	-	-	14½ inches.
,,	,, immediately above the joint,		13	,,
,,	across the centre of the patella,	-	13	,,
,,	below knee-joint,	-	-	12	,,

The limb was placed on a well-padded M'Intyre's splint, a horse-shoe shaped blister was applied to the joint, and subsequently Scott's dressing, covered with even strapping of adhesive plaster to afford firm support. Iodide of potassium in bark, good diet, and porter, were prescribed. When the weather admitted the patient was carried out into the open air.

January 19th.—The dressings were removed, and on re-measuring the joint, it was found to have *increased* in circumference by a quarter of an inch across the patella. I passed an exploring needle into the swelling at the inside; blood and serum escaped.

April 30th.—The patient's health continues good, but she perspires at night. On measurement the joint is found to have increased *two inches and a half* in circumference across the patella. Quinine mixture was substituted for the previous medicine. On consulting with my colleagues, it was determined that amputation of the thigh should be performed. The patient readily consented; in fact, from the first time that I saw the joint, I told her, and her brother, who accompanied her, that it would ultimately require amputation, but that every possible means of saving the limb should be first tried.

On Tuesday, May 1st, 1866, assisted by my colleagues, Professors Hargrave and Geoghegan, and Mr. Tufnell, I proceeded to amputate the thigh in its lower third, by Teale's method. The patient had no breakfast, but got an egg beaten up with brandy early in the morning, and, being nervous, was chloroformed in her bed, and carried with the " poles and sheet " to the operation room. In order to preserve as much of the femur as possible, I took the circumference at the exact point from which the periosteum was found to be enlarged (namely, at the junction of the middle with the lower third of the thigh), and having doubled the tape, mapped out the anterior flap which extended beneath the patella. The internal line was first drawn with ink, so as to avoid the femoral artery, where it pierces the adductor magnus muscle, and leave it in the short flap. The external line was next drawn, and both were united beneath the lower margin of the patella. Thus the long flap was

mapped out from the thigh and leg. The lines for the short flap (one-fourth of the long) were also marked. I may here observe that it is the surgeon's duty, as a clinical teacher, to demonstrate clearly in the presence of the pupils the several steps of every surgical operation; and though, from constant practice, I could at any time perform this special operation without resorting to measurements, yet for the reasons already mentioned, I deem the measurements of consequence. The limb having been drawn over the end of the table, and held steadily by an assistant, and pressure applied on the main artery, I made the lateral incisions, with a catlin, through the integuments only, and joined them below by an incision down to the bone; the flap was next dissected quickly up, first consisting of skin only; the knife was sunk deeply, when the upper edge of the patella was cleared, and thus the long flap was rapidly formed. Serous fluid gushed out when the knife entered the sub-crureal bursa, which had a free communication with the knee-joint. With one sweep of a large amputating knife, down to the bone, the short flap was made and dissected upon a level with the long flap, the retractor applied, and the femur was rapidly and evenly sawn through with Mr. Butcher's saw. I passed a long needle beneath the femoral artery and vein, and secured them by Sir J. Y. Simpson's third method of acupressure. Three branches were also compressed in a similar manner. The cut surface of the flaps were sponged with cold water, and the long flap was allowed to fall down to meet the short; no sutures were introduced. The flap looked very long, but previous experience prevented me interfering with the length of the flap which cannot be too long when made by measurement. The patient recovered quickly from the effects of the chloroform, and was not conscious of the operation having been performed, so thoroughly was she under the influence of this powerful anesthetic. Having taken a small quantity of wine and water, she was, in a short time, carried back to the ward and put into her bed, which was most comfortably prepared; the stump was placed on a pillow covered with oiled silk. A small artery was observed, in a few minutes, to bleed; I secured it also by acupressure. I remained at the patient's bedside for several hours, feeling anxious about the "acupressure," not having had any previous experience of it on so large a vessel as the femoral artery (indeed, so far as I am aware, it was the first case in which this novel and excellent method of arresting hemorrhage was tried on the femoral artery in Dublin.) The patient became very pale, and vomited several times, a common occurrence after the adminis-
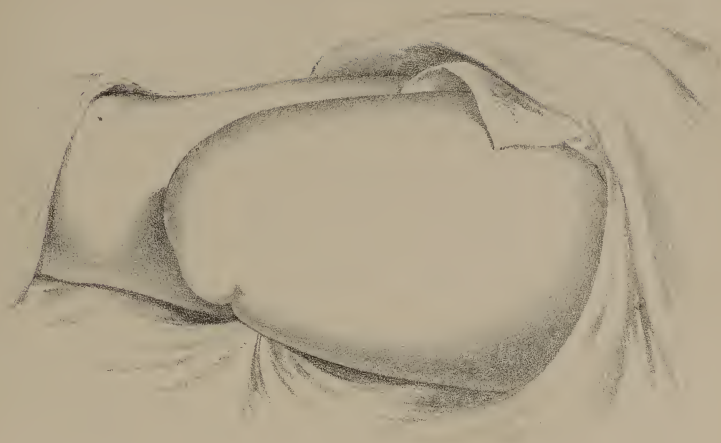
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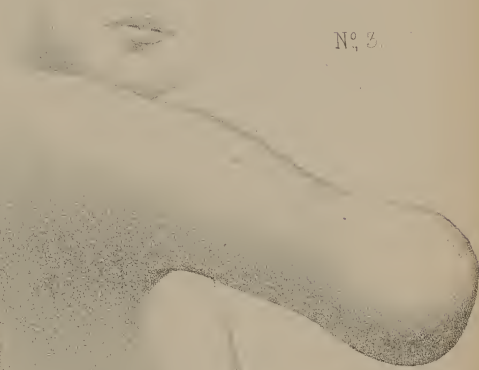
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MR. CROLY ON OPERATIVE SURGERY.

tration of chloroform; and though no blood was lost beyond what is usual in amputations of the thigh, the girl showed early symptoms of dangerous collapse; her pulse became almost imperceptible, she was deadly pale, and her breathing was almost inaudible. I lost no time in lowering her head, allowing a current of fresh air to pass over her through the window, besides fanning her. Carbonate of ammonia was cautiously held to nostrils, and small quantities of brandy and ether were administered. The collapse now became so alarming that I introduced a full sized male catheter into the rectum, and injected brandy and ether. Sinapisms were applied over the epigastrium, heart, and calf of leg. The stomach rejected everything, the pulse occasionally improved and became again extremely feeble. At 1 o'clock she got an anodyne enema, and slept for a couple of hours.

3.30 o'clock.—Patient awake, and being restless, I administered another enema. The catheter was allowed to remain passed well up into the bowel, and nutritive injections were administered regularly without any disturbance whatsoever to the patient. I considered it necessary to remain at her bedside until 8 o'clock, p.m. (more than nine hours from the time of operation). I received valuable aid from my friend and former pupil, Dr. D. B. Hewitt, in combating the collapse which followed the operation.

May 2nd.—Mr. Geoghegan and Mr. Popham, senior and junior resident pupils, kept watch in turn during the night, and reported this morning, at my visit, that the patient passed a restless night, that she slept badly, and vomited frequently. She took ice to relieve the sickness of stomach, and prussic acid with creosote was given in small draughts, and iced soda water as drink.

10 o'clock, p.m.—Stomach settled, patient has taken chicken-broth in small quantities. Nutritive enemata continued every second hour, and a couple of grains of quinine added three times in the day. Temperature of the body natural, pulse rapid and feeble, no sleep throughout the day, anodyne enema containing m. xxx. of Battley administered.

May 3rd., 8 o'clock, a.m.—Patient slept well, had no vomiting during the night, face slightly flushed. Pulse 130 in the minute. I withdrew one of the acupressure needles; not a drop of blood followed. The discharge was removed from under the stump without raising it.

10 o'clock, p.m.—Pulse 130, soft and compressible. Countenance

natural, tongue clean. Anodyne enema administered, continue ice, milk, and chicken-broth. Patient refuses to take wine or brandy. Nutritive injections continued.

May 4th.—Patient slept all night. Pulse 120. Skin cool. Face slightly flushed. Stump looking well. Discharge healthy and free.

May 5th.—Pulse 112, soft and regular. Skin cool. Bowels moved. Patient slept well. Fresh napkin placed under the stump.

May 6th.—Pulse 112. Patient slept well; she ate a bit of chicken and drank some good claret.

May 7th.—Pulse 100.

May 8th.—In the presence of a large number of the pupils I withdrew the three remaining acupressure needles. No hemorrhage. Discharge from stump healthy and free. Patient looks well.

The girl continued to improve until the 15th inst., when she was seized with a rigor, and vomited several times. I ordered a turpentine enema to be administered with O'Beirne's tube, and the stomach to be allowed to rest.

May 16th.—Pulse 120. Skin hot. Face slightly flushed. Tongue clean. Bowels freely acted on by enema. No tenderness in the groin or along the course of the vessels. Discharge from stump healthy but not very copious. Edges of wounds natural. No bagging of matter can be found on most careful examination. The edges of the flaps were kept gently together with strips of adhesive plaster, and a compress of lint was applied over the internal side, as there was a slight bagging of pus.

I made pressure over the end of the bone, but no pain was complained of. The covering of muscle is large, soft, and movable. The patient was soon discharged, the stump being perfectly healed.

The following were the appearances observed on the dissection of the knee joint:—

Femur perfectly sound, and of natural size at the site of amputation. Immediately below section the bone was found suddenly large. The condyles of the femur were converted into an osseous cavity, divided by bony plates. The patella situated low down. The internal side of the joint contained a large quantity of yellow-coloured matter in flakes. The muscles and ligaments around the joint were healthy. There was a large gland (containing bony plates) situated in the popliteal space. The periosteum was absent on the posterior surface of the femur.

I had drawings taken of the first and second stumps, and photographs and casts of the others. I enclosed copies of the photographs to Mr. Teale, and received the following courteous and complimentary letters in reply:—

" St. James' Lodge,
Woodhouse Lane, Leeds,
April 19th, 1866.

" My Dear Sir,—I thank you very much for your kind letter and photograph. The stump is excellent. I shall be very glad to see your cases reported. It is very gratifying to me to receive similar reports from our own country, as well as from distant parts of the world. When you can again spare time to visit Leeds it will give us much pleasure to see you. Our new hospital, now approaching completion, will, I think, interest you much.

" Believe me, my dear Sir,
Yours most truly,
" Thomas P. Teale.

" Henry Gray Croly, Esq."

Mr. Teale's second letter:—

" St. James' Lodge,
Woodhouse Lane, Leeds,
July 16th, 1866.

" My Dear Sir,—Many thanks for your kindness in sending me the photograph of your excellent stump. I have given directions for its being placed in the photographic album of our new school of medicine. It is very gratifying to me to find the rectangular flap amputation most successfully practised by yourself and other surgeons in Dublin. The stumps do not deteriorate, but, on the contrary, improve by age. It will at all times give my son and myself much pleasure to see you in Leeds when you can spare time to come this way. Our new hospital is proceeding admirably; it is expected to be ready to receive patients in a year from this time. I am sure you will be pleased with it.

" Believe me, my dear Sir,
Yours very sincerely,
" Thomas P. Teale.

" Henry Gray Croly, Esq."

I received the following letter from my friend Dr. Clarke relative to Case II.—*vide* plate:—

" Derrycappa, Mountmelick,
November 28th, 1866.

" MY DEAR CROLY,—As you wish, I send you the particulars relative to James Hamilton, operated on by you in the City of Dublin Hospital for strumous affection of the right elbow joint. About five years ago the joint became affected. Every attempt was made to restore it, but without success, when I sent him to you, two years and a-half since. He is now in the enjoyment of good health; has a most excellent stump, with a pad of muscle over it, which, if he had an instrument to aid him in earning his subsistence, would be of the utmost service to him; for it appears to me that no amount of pressure would affect him, as he has just now applied the weight of his body on it on the table before me without suffering in the least.

" Believe me,
Very sincerely yours,
" JOSEPH CLARKE."

Letter from Dr. Gilmore, Castleblaney, Co. Monaghan.

" Castleblaney, 21st March, 1867.

" MY DEAR SIR,—You would have had an earlier reply to your letter only I had not an opportunity of seeing Anne M'Ardle sooner than yesterday. You will be glad to hear she is quite well, and able to make herself generally useful in household affairs. She is loud in her expressions of gratitude to you for the great kindness which she received from your hands when under your care in the City of Dublin Hospital, and more especially for the great skill which you displayed in the management of her case, and the permanent relief which you have afforded her from a most painful and serious disease. From the present condition of the stump you have every reason to be gratified with the result of the operation. I consider the stump to be an exceedingly well formed one. It is perfectly painless, and admirably well adapted for an artificial limb.

" I remain, my dear Sir,
Yours most sincerely,
" SAMUEL GILMORE.

" Henry Gray Croly, Esq,"

I have thus faithfully detailed the history of four interesting cases of amputation by long and short rectangular flaps, and it is gratifying to me that the stumps have met with general approba-

tion. Nothing unusual occurred during or after operation in the three first cases; the stumps were not disturbed for several days after amputation, and no dressing was applied to them. The ordinary ligatures were used, and they separated in the usual time. In the last case, however, I secured the femoral artery and its branches by the third method of acupressure of Sir J. Y. Simpson (viz., by introducing a needle, armed with a twisted wire, under each vessel, and passing a loop of wire over the point-end of the needle and the vessel, and giving it one half twist around the eye-end of needle). On referring to the report of this most instructive and very interesting case it will be observed that I did not bring the flaps together at first. I believe in the majority of cases of amputation that this is the best rule to follow, as it prevents the necessity of reopening the stump in the event of hemorrhage, which is so liable to come on when reaction sets in; but in this special case I naturally felt extremely anxious respecting my patient, having, for the first time in my own practice, applied acupressure instead of the good and safe old ligature. In this case, also, I had to combat collapse following an operation for disease which caused enormous swelling of the joint and enlargement of the blood-vessels; and the patient, although healthy, and having a sound heart, had naturally a very feeble pulse; and (as I subsequently ascertained) was much upset by the receipt of a letter from her parents on the morning of operation urgently requesting her to go home, which she would not consent to. The acupressure acted admirably in this case. I could not account for the awful collapse, which was nearly fatal. The treatment which I adopted—namely, lowering the head, fanning the face, cautiously administering diffusible stimuli by the mouth, the injection of brandy and ether high up into the bowel, the application of sinapisms over the region of the heart and solar plexus had, after some hours, the desired effect. I dreaded the giving way or slipping of the acupressure needles or wires, and took the precaution of placing a tourniquet loosely over the trunk of the femoral artery, so that at a moment's notice the vessels could have been compressed. The vomiting which subsequently occurred in this case, and the consequent necessity for supporting the system entirely by nutritive injections for some days, is also of much practical interest. The rigor which occurred on the 15th day I could not in any way account for. It passed off, and the patient ultimately made an excellent recovery.

My able colleague, Professor Geoghegan, performed amputation of the lower third of the right thigh in January, 1864, by the rectangular flap method for suppurative destruction of the knee joint consequent on a small tuberculous abscess in the head of the tibia, which was generally hypertrophied.   The patient was a man, about thirty-five years of age, and is now in the enjoyment of sound health.   The following is Dr. Geoghegan's description of the operation :—" The base of the long anterior flap (coinciding with the point of section of the bone) was situated about a hand's breadth above the upper margin of the patella.   By careful measurement of the limb operated on, and of the opposite one respectively, it was found that at the side of the operation the limb was curtailed by one-fifth of its length only.   The length and breadth of the anterior flap was about eight inches, and the lower edge of the latter passed about an inch beneath the lower margin of the patella.   The objections, therefore, to the employment of Teale's method as regards lower thigh amputations, on the score of undue curtailment of bone, are founded on misapprehension."   I visited him on the 17th of March last, and found him, with an artificial limb, walking about and able to work all day as a porter on the quay.   The stump is excellent and well covered.   The cicatrix is considerably above and behind the end of the bone.

My particular friend, Mr. George H. Porter, the eminent senior surgeon of the Meath Hospital, deserves the credit of having been the first in Dublin to perform amputation by the long and short rectangular flap, and informs me that he was induced to adopt this mode of operating by the favourable representations which I had given him of the operation—he performed the operation twice on the thigh successfully.

The rectangular flap operation has been objected to on the grounds that there is an unnecessary sacrifice of bone, and that there is a larger extent of surface exposed to suppurate than in amputation by other methods.   To meet the first objection I refer the reader to my fourth case in which I amputated by this mode at the lower third of the thigh, and divided the bone exactly at the point of junction between the sound and diseased parts.   I was enabled to do so by taking the long flap partly from the leg, by going below the patella, and thus forming as long if not a longer stump than I could have done in this case by any other method of operating.

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[a] The stump of A. McA. (Plate I., Case IV.) is only three inches and a half shorter

In certain cases of accident, in which the muscles are much torn, it might so happen that the long flap could not be made without a little extra sacrifice of bone, but this is only an exceptional case.

In reply to the second objection, I would observe that in my opinion, the extent of surface exposed to suppuration is more apparent than real, as can be proved by comparing the combined surfaces of the flaps made by transfixion or the circular mode.

In each of my cases the lateral incisions united rapidly, and partly by " the first intention," and the amount of suppuration was less than I have seen from the ordinary flap operations.

Being desirous of satisfying myself on these important practical points, I submitted queries to Mr. Teale a few days ago, and received the following kind reply, which I now publish :—

" March 20th, 1867.
St. James' Lodge,
Woodhouse Lane, Leeds.

" My Dear Sir,—I will with pleasure reply to your inquiries on amputation, and at the same time mention the slight modifications in the operation which I have adopted since the publication of my book many years ago.

" 1. The sacrifice of bone need not be any greater in rectangular than in circular or transfixion operations.

" To give additional length of bone, I now make the lower transverse line of the long flap as low as the apex of the patella. The skin and cellular tissue are then dissected, as far but no further than the upper border of the patella, when the knife is carried deeply through the extensor muscles, and the flap completed by cutting upwards. In amputation of the thigh for accident in powerful fleshy subjects in order to save bone, I not only make the lower transverse line of the flap as low as the apex of the patella, but I somewhat shorten the flap, knowing that the circumference of the thigh in the largely developed state of its muscles would give greater length than is absolutely necessary after the muscles have become shrunken. In

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than the thigh of the sound limb. This is remarkable when contrasted with the length of stump after amputation by other methods.

I lately examined the stump of a woman whose thigh was amputated forty-nine years ago by an eminent surgeon in this city for disease of the knee-joint. The stump measures only *seven inches*, and the cicatrix adheres to the end of the bone.

In another case which I saw a short time since, amputated seventeen years ago, the stump (a thigh) measured only *five inches*—the end of the bone was badly covered, and the cicatrix was adherent.

such subjects also, in cutting the flap upwards, I avoid taking all the fleshy mass in front of the bone, but cut it upwards so as to have about half the thickness of the extensor muscles—a sufficient quantity of flesh and skin for surrounding the end of the bone is thus obtained.

"2. I believe the extent of suppurating surface is nearly the same in rectangular as in the two other modes of amputating, provided the operations are all equally well performed so as to secure a good stump.

"3. I make the lateral incision of the long flap through the integuments only, in order to allow for a little transverse contraction of skin, and thereby to secure the perfect covering of the muscles by skin; otherwise a little bulging out of muscles at the sides might require the skin to be too tightly drawn over the sides of the stump. These remarks apply mainly to amputation of the thigh. My son is very well, and joins me in kindest remembrance, &c.

"Believe me, my dear Sir,

Yours most truly,

"Thomas P. Teale.

"H. G. Croly, Esq."

From the foregoing details of the rectangular flap amputation the following practical conclusions may be deduced:—

1. This mode of operating combines the advantages of both the circular and the flap amputation, without the disadvantages of either. The vessels are divided at right angles, and ample covering of muscle is provided for the bone, while the adherent cicatrix is avoided.

2. The mortality is less after amputation by this mode than by other methods according to statistics already published, and the result of the operation performed by myself and others in this country confirms this important fact.

3. Tension is avoided by ample flaps.

4. The plastic process is not interfered with, and the liability to purulent absorption is diminished.

5. The lateral incisions in most cases unite quickly, and the transverse incision allows the discharges to escape freely.

6. There is no need of bandaging or other dressing, but simply to place the stump on a pillow covered with oiled silk.

7. In marking out the lines for this amputation in the thigh, the surgeon must be careful to avoid including the femoral artery in

the long flap, or splitting the vessel where it pierces the adductor magnus muscle.

8. In amputations of the leg there is a danger of wounding the anterior tibial artery at the base of the flap; to avoid this the handle of the scalpel should be used in raising up the vessels from the inter-osseous membrane; and in the operation high up in the leg the surgeon must be careful not to cut the origin of the anterior tibial artery when dissecting the short flap.

Art. XIV.—*Reports of Hospital Cases.—On Injuries of the Wrist and Ankle Joints.* By William Mac Cormac, M.A., M.D., Q.U.I., F.R.C.S.I.; Surgeon to the Belfast General Hospital; and Vice-President of the Ulster Medical Society.

I.—EXTENSIVE INJURY OF THE HAND, NECESSITATING THE REMOVAL OF THE WHOLE OF THE CARPUS, AND OF MOST OF THE METACARPUS—RECOVERY WITH A USEFUL LIMB.

II.—LACERATED WOUND OF THE BACK OF THE WRIST, INVOLVING THE JOINTS OF THE CARPUS—RECOVERY WITH A USEFUL HAND.

III.—LACERATION OF THE BACK OF THE WRIST, INVOLVING THE CARPAL JOINTS, AND ALSO OF THE PALM—RECOVERY WITH A USEFUL HAND.

IV.—COMPOUND DISLOCATION INWARDS OF THE ANKLE JOINT, WITH FRACTURE OF THE INNER MALLEOLUS, AND COMMINUTED FRACTURE OF THE FIBULA—DEATH FROM PYEMIA.

V.—COMPOUND DISLOCATION OF THE ANKLE JOINT, WITH COMPLETE DISLOCATION OF THE ASTRAGALUS OUTWARDS—EXCISION OF THE BONE—RECOVERY WITH A USEFUL FOOT.

In the following paper I purpose giving an account of some cases of injury of the wrist and ankle joints. I believe they will be considered interesting since they serve to show how far it is possible, in some instances at least, to preserve a limb and its usefulness after severe injury and under rather unfavourable circumstances.

In an hospital situated in the midst of a large manufacturing population, cases of accident are of necessity frequent, and of these none are more so than injuries of the hand or arm requiring partial

or complete amputation.   Of course in such cases the practice of conservative surgery should be carried to the utmost limit that it can be with prudence brought.   To none is this of greater moment than to working men and women.   Unfortunately the mill-working class, who are most frequently the subject of such injuries, are not usually in the enjoyment of the best health.   They are confined many hours in close ill-ventilated rooms by day, and in yet closer and worse ventilated rooms by night, while too often their habitual food is of the most innutritious kind.   The consequence is that when they incur injuries by machinery, injuries which in spite of the best directed efforts to guard against them but too frequently happen, the wounds often fail to heal kindly.   Frequently a wound will close up and seem to have united by the first intention, yet after the lapse of a day or two the adhesions will break down, and more or less unhealthy inflammation be set up, not seldom accompanied by diffuse suppuration in the neighbourhood of the hurt.

I am able to submit to the readers of this Journal not only the history and treatment of each of the following cases, but also the condition of the patient at a considerable interval after recovery, when the amount of usefulness the limb was likely to attain to might be more fairly estimated.

I thought it desirable yet further to illustrate the results by lithographs copied either from careful drawings of the parts, or from photographs.   The plates have been faithfully and beautifully executed.

Without further preface, then, I shall proceed to furnish the particulars of the first case.

I.—Mary Jane Waterson, an interesting child of ten years of age, was admitted to hospital under my care, May 21st, 1866.   She was employed in one of the mills on " full time," contrary to the Act of Parliament.   Whilst she was engaged on the morning of the 21st cleaning a spinning frame, her left hand was caught between the cog-wheels at the end of the machine.   Accidents caused by these wheels are very frequent, and as may be imagined any portion of the hand which passes between them must be irretrievably injured.   It often looks, in fact, somewhat as if it had been teased out like a piece of oakum.

On examining the child's hand, I found three-fifths of it in a shocking condition.   The middle, third, and little fingers had been entangled, as well as the corresponding metacarpal bones.   The

soft parts covering them were cut up into shreds, while the bones themselves were comminuted. The forefinger as far as the middle of the second phalanx, was also quite chopped up, the term really best fitted to express the character of the injury. In short, the entire inner portion of the hand, up to the wrist joint, was hanging semi-detached from the stump of the forefinger and the thumb which last, fortunately, was uninjured.

At first sight, it appeared as if amputation, at or above the wrist, were the only thing practicable, the more so, as the dragging and stretching of the soft parts which so frequently accompany accidents such as this, inflict injury which does not at first meet the eye, and prove the source of sloughing and secondary hemorrhage with all their attendant ills. This is more especially the case when amputation is performed too near the seat of injury.

I determined, however, if it were possible, to try to save at least a portion of the mutilated hand.

The little patient having been put under the influence of chloroform, an incision was made through the sound structures left, as near as practicable to the lacerated margins, commencing at the base of the forefinger, and extending on the palmar and dorsal aspects of the hand as high as the wrist. Only those parts were removed which, had they been retained, would inevitably have perished. The carpus, then, remained quite exposed, and there were no soft tissues available wherewith to form even a partial covering. Considering the free inter-communication of the carpal joints, the probability of severe inflammation being set up in them, possibly followed by death of the greater portion of the carpus, and at the best subsequent anchylosis of the wrist joint, should amputation not prove necessary, I thought it better to excise it at once. Accordingly I removed the entire carpus, which is a somewhat remarkable feature in this case. The ends of the metacarpal bones of the thumb and index finger were then placed in contact with the end of the radius, which, with the ulna, had not been interfered with. But it was not until I had snipped off with bone forceps the projecting extremity of the metacarpal bone of the index finger, that I could draw the edges of the skin together. The ulnar artery was the only vessel requiring ligature. Two sutures were inserted, and water dressing was applied. The forefinger was amputated so as to leave the base of the second phalanx intact. The hand and forearm were placed on a light anterior splint, and a bandage was applied over all.

On the 22nd, the day after the operation, the hand felt quite comfortable and there was little febrile disturbance. On the 23rd, fresh dressings were applied, the lint being arranged in strips like a many-tailed bandage so as to disturb the wound as little as possible, the patient going on very favourably. Nutritious diet was ordered. On the 28th, the parts were found to be healing kindly with no swelling or inflammation in the arm, and so little discharge that the wound was directed to be dressed only on alternate days. The forefinger has now almost healed. On June 2nd, twelve days after the accident, the patient was permitted to rise, and from this date until her discharge from hospital she continued to get on in every respect well. The splint was shifted by degrees a little higher up, as the parts gained solidity sufficient to permit them to dispense with its support, and also to leave the thumb and stump of the forefinger freedom to move. During the cicatrization of the wound the hand if permitted would have been drawn towards the ulnar side, but this tendency was counteracted after a time by the careful management of the splint and dressings. Six weeks after admission, namely on the 3rd July, the child left the hospital in the following condition. The wound at the wrist had almost quite healed. There was some motion in the substitute for the joint. The stump of the forefinger was quite healed, but there was little power of apposing the thumb to it. The ball of the thumb was atrophied and the joints of both fingers were very stiff. The patient was enjoined to use the hand as much as possible, for the purpose of realizing free motion in the different joints, and exercising the residuary muscles.

In September, two months after, the report is that since leaving hospital the child, through fear of incurring pain, does not fully carry out the instructions given to her. Nevertheless, she has gained a considerable amount of power. She can move the wrist freely, pick up small objects and carry a light basket. No doubt exercise will impart additional facilities in respect of using those portions of the hand which have been preserved.

I have since taken care to see that my directions were complied with, and the result has been most satisfactory. The first figure in Plate I. represents the girl in the act of knitting, which she does with rapidity and ease. It, as well as the other figure on the plate, is copied from a photograph. The hand has gained greatly in strength. The ball of the thumb has begun to get firm again. The different joints are supple, the motion at the wrist is almost as free as if the joint were yet intact, and there is considerable power of apposing

PLATE 1.

Fig. 1
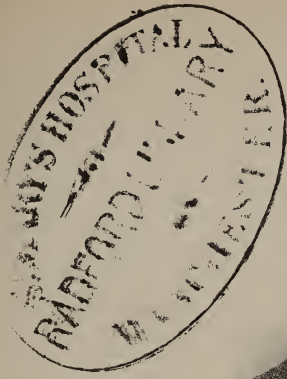
Fig. 2

the forefinger to the thumb. The child is able to pick up either an orange or a pin indifferently. In short she is possessed of an extremely useful, if not a perfect member.

The second figure in Plate I. represents, on a larger scale, the portion of the hand which has been preserved, and the parts which have been removed. The articulated bones forcibly display how very considerable was the portion of the hand which had been lost. The child's arm is made to rest upon the table so as to show the details of the cicatrix, and the ordinary position which the limb assumes when at rest. The only possible alternative in this case would have been, I believe, amputation through the lower part of the forearm. The necessity for the removal of the entire carpus, and of most of the metacarpus and phalanges, under circumstances similar to those I have detailed, may not frequently arise, but it cannot prove otherwise than satisfactory to learn that even after such extensive mutilation a really useful member can be preserved, that the muscles may form fresh attachments and regain their power, and that a new and very movable joint can be substituted for the wrist. With time, too, and exercise this fragment of a hand will yet further improve in availability and strength.

II.—Early on the morning of the 13th May, 1865, I received a summons to proceed to hospital as a case had been admitted from one of the mills requiring amputation of the forearm. On my arrival, the patient was placed upon the operating table, the necessary instruments were at hand, and the house surgeon, assured, from his examination of the case, that amputation was inevitable, stood ready to administer chloroform, not deeming it needful that I should even see the injury or remove the temporary dressings before the patient had been rendered insensible by the anesthetic. I thought it only right, however, to make a preliminary examination, were it only for forms sake, and on removing the strips of lint which covered the part a frightfully lacerated wound was disclosed.

Ellen Beatty, the subject of this accident, was a married woman, twenty-five years of age, previously in the enjoyment of good health, but of an anxious temperament. Her husband had been sent to jaol for misconduct, and she was trying to gain a livelihood by working in a mill. That morning her left hand had been caught in a fluting machine, which caused the following extensive injury on the back of the wrist. Commencing three-quarters of an inch above the extremity of the radius, and close to the outer border of the arm, a

wound was seen extending obliquely downwards and inwards right across the wrist joint, and terminating over the bases of the metacarpal bones on the ulnar border of the hand.   At its commencement the wound was comparatively superficial, and thus most of the long and short extensors of the radial carpus, and of the thumb escaped injury, but it grew rapidly deeper, and divided in its course everything else on the back of the wrist.   The wrist joint, and mediocarpal articulations, were laid open.   The os magnum and unciform bones were almost cut through, while the metacarpals of both ring and little fingers were completely severed.

After a careful examination of the extent of injury, and also of the manner in which it had been inflicted, I decided, in place of amputating through the forearm, to try to preserve the hand.   I believed, all things considered, that there was a reasonable chance of so doing, and in case of the worst, that secondary amputation would be in reserve.   I have said that I took into consideration the manner in which the wound had been inflicted.   It was important to do so.   A fluting machine cuts the parts rather than tears them, and the injury inflicted is usually limited to the wound itself.   It is far otherwise in cases of injury occasioned by some other portions of mill machinery.   I procured a splint long enough to extend from the tips of the fingers to the elbow, carefully padded it, and placed the arm upon it in the prone position.   The wound was drawn together by sutures, strips of lint were placed over it and a many-tailed bandage was applied.   The dressings were directed to be kept wet and cold, and the patient was removed to bed.   A diet of the most nutritious kind was ordered.

Next day, the 14th the patient complained of severe pain, and had slept very badly.   She was ordered an opiate draught at night.

On the 15th new dressings were applied, and so arranged that during their removal they should not in the slightest disturb the wound.

On the 17th, four days after the accident, healthy suppuration had become established.   A couple of days afterwards some sloughing was observed at the ulnar extremity of the wound.   The woman was now ordered a bottle of porter at dinner.

On the 24th the patient was getting on very favourably.   The wound looked well, her appetite was good and she had slept well. Her own expression every morning in answer to my inquiry invariably was, " I am first rate sir."

On the 26th she reported that she had had a shivering fit during the preceding night, and her pulse had risen to 120.

On the 30th the report was that for the last few days the pulse had kept unusually high. When excited by the entrance of the surgeon and pupils into the ward it frequently rose to 140, and although often counted, it never fell beneath 120. In all other respects the patient seemed doing remarkably well. She was now permitted to go about the hospital grounds, having for some days previously been walking in the ward.

On June 11th the pulse is reported to have fallen for the first time. Its frequency to-day is 100. The wound is healing fast. The splint was shifted a little so as to leave the fingers free, and passive motion in them was begun.

On June 21st it is reported that for the last ten days passive motion not only of the fingers but of the wrist itself has been kept up, and that considerable freedom of motion was the result.

Beatty was discharged from hospital on July 5th, a little more than seven weeks after her admission. The wound was healed. No complication of any kind arose during the treatment. The wrist could be flexed and extended to a notable degree. The motions of the thumb seemed nearly perfect. The fingers were still somewhat stiff, and at the metacarpo-phalangeal joints capable of little or no motion. The patient was enjoined to exercise the hand assiduously. The results, even during so brief a period, have proved most satisfactory.

This case was during its progress a source of considerable anxiety and trouble, but the termination yielded most ample compensation. The unusual frequency of the pulse, when first observed, occasioned much uneasiness, the more especially as the occurrence of a rigor at the same time implied the possibility of blood-poisoning. No untoward accident however resulted, and the case throughout was otherwise exempt from any serious feature.

In February 1866, I again saw Beatty. It was just ten months after the hurt, and I was astonished at the amount of motion enjoyed by the hand. The two injured metacarpal bones were soldered to the carpus, but the motion in the wrist was very considerable, and she seemed to have complete control over the thumb, which she can with the greatest facility appose to the rest of the fingers. She cannot flex the metacarpo-phalangeal joints, but the motion in the other finger joints is good. She can sew and perform with ease any household task. In the mill, where she still works, one of her duties is to pick up the ends of broken threads at the spinning frame, and knot them with quickness and precision.

In January 1867 the photograph was taken, from which Fig. 1 on Plate II. has been copied. It represents the hand in an extended position, also the cicatrix of the wound. Fig. 2 represents the amount of flexion of which the limb is capable. It is very considerable, and I have no doubt the early induction of passive motion had much to do with the satisfactory result.

III.—The next case, also one of injury to the wrist, affords an example of recovery after an injury more extensive and severe than in the former instance. Samuel M'Cullagh, a man twenty-seven years of age, apparently healthy, and of temperate habits, was admitted to hospital under my care on the 19th July 1865. The accident took place in a mill in the following manner. He was trying to replace a belt which had slipped off the "drum" of a rapidly revolving horizontal shaft. This metal wheel or "drum" revolved within an inch and a half of one of the beams supporting the ceiling of the room, and the man's left hand was dragged between the two. The edge of the drum cut open the palm, while the back of the wrist was lacerated by the beam. A deep wound extended from an inch above the wrist, on the radial side, obliquely downwards and inwards to the ulnar border, terminating over the metacarpal of the little finger. Most of the soft parts on the back of the wrist were divided, but owing to the degree of obliquity in the direction of the wound, the extensors of the radial and ulnar carpus, and of the thumb seemed for the most part to have escaped. All the joints of the carpus were opened, and the bones more or less injured, whilst a wedge-shaped piece, extending through three-fourths of its thickness, was cut out of the styloid process of the radius. In the palm yet more extensive damage had been inflicted upon the soft parts. A wound, commencing in the ball of the thumb, reached as far as the hypothenar eminence, and across it, quite exposed, lay the tendons of the flexor sublimis muscle. The finger could be readily passed underneath them. The flexor brevis pollicis, and the adductor pollicis, were torn from their carpal attachments, and lay contracted in a contused mass in the angle of the wound. There was no hemorrhage.

It certainly appeared from the nature of the injury that the chance of preserving a useful hand, or any hand at all, was very slight. I determined, however, that the patient should get that chance. Simple water dressing was applied to the wounds, and a splint, was carefully adjusted so as to give support to the hand and

PLATE 2

Fig. 1

Fig. 2

Fig. 3

Fig. 4

W. MAC CORMAC ON THE TREATMENT OF INJURIES OF THE WRIST.
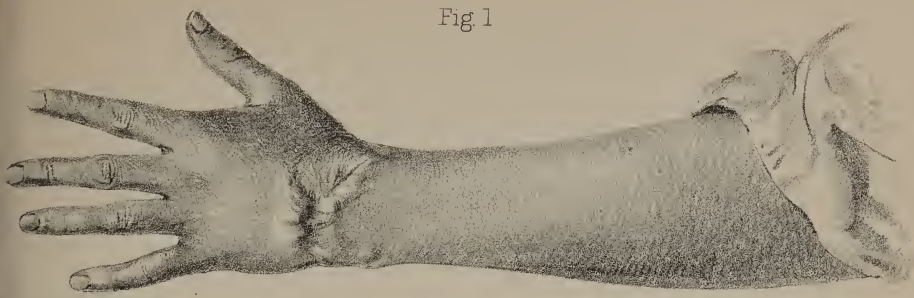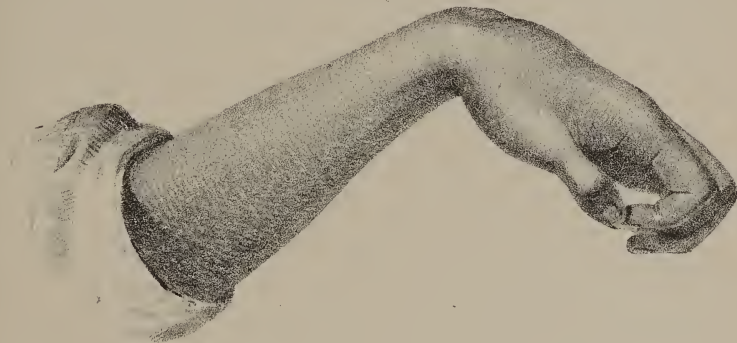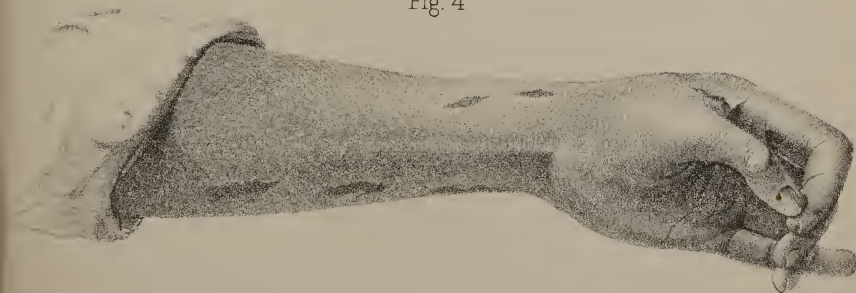
wrist. The dressings were so arranged as to ensure their easy removal when requisite.

The following morning, the 20th, the pulse was 112, the tongue was covered with a whitish fur, and there was both local and constitutional disturbance. The patient complained of great pain, which proved so severe during the night that the house surgeon thought it right to administer a full opiate. The bowels being confined, I prescribed a mixture of sulphate of quinine and sulphate of magnesia in solution.

On the 21st a large slough was found on the back of the wrist on removing the dressings. The palmar wound was also in a sloughy condition. Inflammatory redness and swelling had extended half way up the forearm.

On the 24th the patient's general condition was very bad. The wounds were discharging offensive pus. The inflammation had extended above the elbow. The hand was swollen. A large poultice saturated with salt was applied so as to envelope the hand and arm, and the wounds were irrigated twice a day with tepid brine, for the purpose of cleaning away the sloughs, and fetid pus. Five grains of quinine were now exhibited thrice daily, together with four ounces of port wine, and a nutritious diet.

On the 25th, distinct fluctuation was made out on the lower and posterior part of the radial border of forearm. An incision having been practised matter was copiously discharged. The wine was increased to six ounces.

On the 26th, the patient was a great deal worse. The arm had swelled as high as the shoulder. There was distinct evidence of fresh accumulations of matter. I found it necessary to make four incisions in order to let it escape. A large quantity of pus flowed away from each of the openings, giving almost immediate relief. The cicatrices of the incisions are shown in Plate II., Figs. 3 and 4.

On the 27th, the report states that the house surgeon had been summoned to the patient about midnight, on account of smart hemorrhage having set in from one of the incisions made on the radial side of the arm. About four ounces of blood were lost, and it was found necessary to plug the wound in order to restrain the bleeding. This morning the patient was very weak, and his pulse was 100. The discharge from the openings was excessive. He had lost his appetite, and there was also a tendency to diarrhea. The inflammatory swelling in the arm and forearm had to a great extent subsided. He was this day ordered ten ounces of wine, and

a mixture containing quinine, aromatic sulphuric acid, and compound tincture of cardamoms.

On the following day, the 28th, more matter was discovered deeply seated over the upper part of the ulna. A correspondingly deep incision permitted a large quantity to escape.

On the 30th the poor man's sufferings seemed to have reached their climax. The purulent discharge was enormous, requiring the poultices to be renewed thrice a day. There was a great tendency for the pus to burrow and to form sinuses, in spite of the free incisions which had been made as soon as ever it could be detected. The excessive discharge was wearing out the strength, while the patient's distress was so great that he besought me to relieve him by amputating his arm.

After this date, however, he began slowly to improve. A large slough, notwithstanding, formed in the situation of one of the ulnar incisions, fresh accumulations of matter had to be evacuated, the arm being incised in all some nine times, and there was a return of the secondary hemorrhage on the 5th of August, which was with much difficulty restrained. Nevertheless the swelling in the parts diminished by degrees, and so did the discharge. Water dressing was substituted for the poultices.

On the 14th August, fifty-three days after the accident, the patient was able to rise for a short time. His arm was supported in a gutta-percha mould, which had been carefully adjusted. The discharge was greatly diminished, and the wounds were filled with healthy granulations.

On the 17th the report states that the man was rapidly improving. In the centre of the granulating wound on the back of the wrist, a piece of carious bone had become visible. With a pair of forceps and a slight amount of force I removed what proved to be the os magnum in a necrosed condition.

On the 23rd of September, sixty-six days after his admission to hospital, I recommended M'Cullagh to go home as I thought the healing process would probably proceed better without than within the walls of the hospital, and to report progress from time to time.

I have thus recorded the more important features of the case. It is, I think, encouraging to know that the hand may be preserved after such severe injury, and under conditions otherwise by no means favourable. The diffuse inflammation and suppuration which had to so serious an extent ensued, form a striking contrast

to the preceding cases where there was nothing of the kind.   Slough-
ing, secondary hemorrhage, and tedious healing, were all present and
proved sources of much anxiety.   No doubt the injuries done to so
many tendinous structures, to a certain extent explain the severity of
the symptoms.   But doubtless a bad and insufficient dietary, with
long hours of work, had also exerted their evil influence.

When M'Cullagh left the hospital, and for some time afterwards,
his hand was almost useless, but he has now long since returned
to his occupation, and the parts have gained very considerable
power of motion.   The wrist joint is anchylosed, and the little
finger remains powerless, being capable of neither extension nor
flexion.   Nevertheless, in spite of these, and of the injury done to
the muscles by the diffuse suppuration in the forearm, as well as the
division of the principal extensor tendons, and the laceration and
exposure of the flexors in the palm, the hand enjoys a wonderful
amount of power.   M'Cullagh is now, some eighteen months
after the accident, able to perform his daily routine of duties nearly
as well as before, and no artificial substitute, were it even within
his reach, could afford him one half the facilities he now possesses.
Fig. 3 on Plate II. is copied from a photograph, and represents the
hand extended.   It shows the cicatrix of the wound of the wrist,
and the marks of the incisions, and sloughs.   Fig. 4, represents the
hand flexed.   The thumb and three fingers can be apposed, but
not the fourth finger.   The scars of a portion of the palmar
laceration, and of the incisions made on the front of the forearm,
are all visible.

IV.—The fatal result of the following case serves to illustrate the
serious character of compound injuries of the ankle joint.   Between
this and the accident next described there are many points of
resemblance.   In the first the foot was completely displaced out-
wards and the ankle inwards, with an extensive wound across the
internal malleolus, while in the second case the converse occurred,
and the wound occupied the outer side of the joint.   The injuries
happened in both instances to men of somewhat similar age,
habits, and constitution.

On the 30th August, 1865, Andrew Mullan, a labourer, 39 years
of age, of spare frame and healthy appearance, was admitted to one
of my wards.   Whilst at work on the railway, he was struck on the
outer side of the leg, just above the ankle, by a beam swinging
round in a crane.   The foot and heel were at the same time caught

on the inner side by the machinery, and the result was, that the ankle was forcibly dislocated inwards.

On examination, I found a wound extending from the front of the ankle on the inner side to the margin of the tendo-Achilles. The internal malleolus, which was fractured, protruded. The fibula was comminuted about three inches above its extremity. The foot was everted and abducted, and the tibio tarsal joint so fully laid open that I could ascertain by means of the finger that the articular surfaces composing it had escaped injury. The principal arteries and nerves were unhurt. There was no bleeding

Mullan admitted that he had been a hard drinker, and an excessive smoker. He looked a much older man than he really was. I thought the results of so extensive an injury in a constitution impaired by excess were not likely to prove favourable, and explained this to the poor fellow who would not permit the possibility of amputation to be even mentioned to him. The only alternative was to try to preserve the foot. The dislocation was reduced without difficulty. Wire sutures were introduced in the wound, and an internal and external splint, with a foot-piece, was applied. The pad on the inner side was arranged so as to maintain the foot in a position of slight adduction, as when Dupuytren's splint for fractured fibula is used. Simple lint dressings, wet with spirit lotion, were applied over the foot and ankle. On the 1st September, two days after, although everything was maintained in a good position, both splints and dressings had to be removed, as the parts were filled with maggots. Condy's fluid diluted was freely used in order to prevent their recurrence. On the 7th the patient felt the limb easy. The pulse was 68. The greatest attention to cleanliness, however, and the employment of Condy's fluid, even of full strength, proved insufficient to prevent the fresh formation of maggots which reappeared day after day with amazing fertility. After trying several means without success, I found that a saturated solution of salt and water, when used to moisten the dressings, at once put a stop to any further appearance of these unpleasant animals, thereby adding much to the comfort of the patient. Mullan's general condition did not improve, the discharge of matter was copious and unhealthy, and a slough formed over the fibula partly from the pressure of the splint. Interrupted splints, arranged so as to leave the ankle joint free, were substituted for the others, which permitted the parts to be readily dressed.

On the 12th and 13th abscesses, which formed over the outer

ankle, were opened. The suppuration from the wound is diminished. The patient is quite insensible to pain.   Very little action is going on in the parts.   The best diet that the hospital can give, varied according to taste, and a bottle of porter are allowed daily. A severe rigor lasting twenty minutes, and followed by profuse sweating, occurred on the 16th.   The patient is now in a state of extreme prostration.   The pulse numbers 68, and is very weak. The tongue is covered with a blackish brown fur, and the breath has a heavy sweetish, and peculiarly offensive odour.   This I have always observed in cases of pyemia.   The skin has assumed a yellow tinge. Some whiskey was now ordered, and a trial was given to the sulphurous acid treatment.   The bisulphite of soda in half drachm doses, largely diluted with water, was directed to be taken every six hours, and subsequently every four hours.   For two days a marked improvement took place in the symptoms, but then the rigors and sweatings returned worse than before.   The pulse became intermittent.   Diarrhea set in, and the stools passed were very fetid. The inflammatory swelling in the limb subsided, and all action, healthy or unhealthy, ceased.   The stomach also began to reject nourishment, which it previously had borne very well. Large doses of quinine were substituted for the bisulphite of soda, opiates were administered at night to procure rest, and an increased allowance of stimulants was ordered.

Nevertheless Mullan's condition proceeded from bad to worse, the rigors increased in frequency and severity, and he began to vomit a blackish-brown fluid, not unlike what was passing at the same time by the bowels.   No treatment seemed to influence the course of the malady, and on the 25th September, nearly four weeks after the accident, the man sank from the effects of blood-poisoning.

No general *post mortem* could be obtained, but on examining the injured joint the upper surface of the astragalus was found denuded of cartilage, while that of the articular surfaces of the tibia and fibula had not been wholly removed.

The point of practical importance to consider here is whether life could have been preserved had primary amputation been resorted to.   I confess I think it could not.   The general conditions productive of pyemia would have remained much the same, while the additional shock of amputation would probably have exercised a most injurious effect.

It may be worth while to observe that the treatment of pyemia, by the administration of sulphites, which has of late been so

strongly recommended, seems perfectly useless. I have unfortunately had many opportunities of trying it, and my experience in other cases has been similar to that in the present instance. Several times a temporary amendment was observed, but this soon passed away and the disease proceeded quite uninfluenced by the medicine or, if influenced at all, only for the worse, as flatulence, great irritability of the stomach, and diarrhea were often induced by it. The experience of my colleagues, and some of them have given an ample trial to this method of treatment, is, I may add, identical with my own.

V.—The last case to which I now wish to advert is one of compound and complete dislocation of the body of the astragalus outwards, complicated with fracture of the neck of the bone, the head remaining *in situ.*

It must be obvious, from the situation of the astragalus, deeply placed amidst the bones of the leg and foot, and surrounded on all sides by ligaments and tendons, that nothing short of great violence is capable of displacing it. The accident is, in fact, comparatively rare, and is one of the most serious, both in its character and consequences, with which the surgeon has to deal. For these reasons, and also because the best method of treatment is by no means unanimously agreed upon, I believe the history, treatment, and final result of the following case, will not prove uninteresting. Dislocation inwards of the ankle, or of its component parts, is comparatively common, but dislocation outwards is quite the reverse, and, as has been pointed out by Malgaigne, is mostly always compound.

Joseph Hamilton, a labouring man, 46 years of age, was admitted to hospital under my care on the 9th April, 1866, with dislocation of the astragalus of the right foot. For fifteen years he had been a soldier, the greater portion of the time being spent abroad. While soldiering, like most of his class, he was addicted to strong drink, and he had had attacks of yellow fever and of ague. His general health was, however, otherwise good, although he looks considerably older than his stated age.

The accident happened while Hamilton was driving a young horse. The animal suddenly becoming unmanageable, the driver was thrown out on the roadside, falling on the top of some logs of timber. The fore part of the foot got wedged between two of the logs, Hamilton at the same time falling on his left side, and the

PLATE 3.

Fig. 1

Fig. 2

D.R W. MAC CORMAC ON THE TREATMENT OF INJURIES OF THE ANKLE.
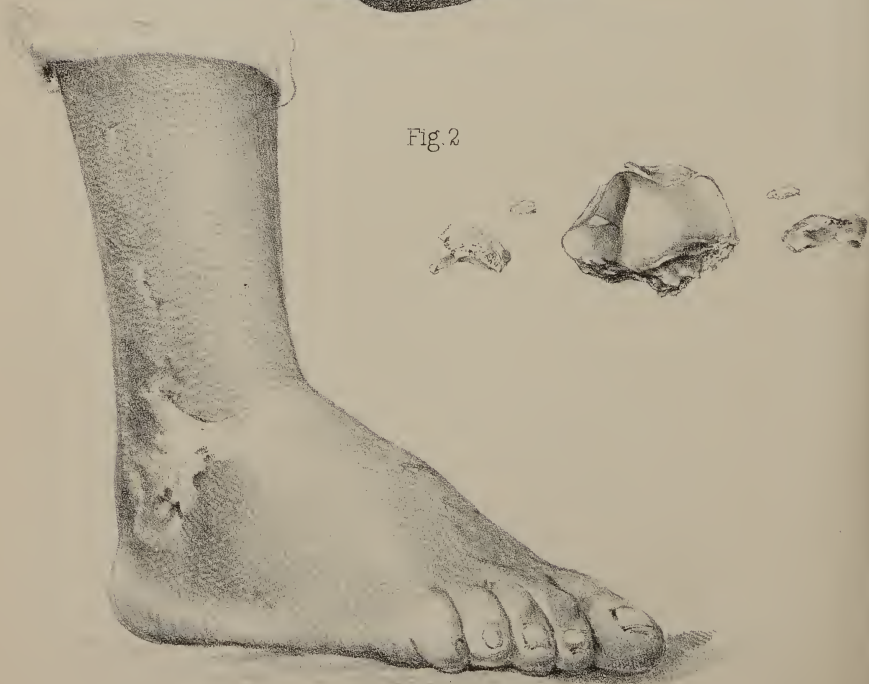
man's weight being thus exerted at the end of a long lever with irresistible force, dislocated the ankle outwards.

Having examined the injury I found that a wound, nearly four inches long, and two and a half inches wide at the broadest portion, extended across the outer malleolus, from the instep to the tendo-Achilles. The edges of the wound were tense and contused, and divaricated by the displaced astragalus, which partially protruded. The foot was forcibly inverted and adducted, and inclined at somewhat less than a right angle to the axis of the leg, so that supposing the patient erect the outer border of the foot would rest upon the ground, and the toes be directed towards the opposite instep. The internal malleolus was entirely hidden, its usual situation being occupied by a deep sulcus, beneath which the inner portion of the heel formed a marked projection. It was impossible to mistake the nature of the injury. In the wound on the outer side, the most prominent object was the large articulating facet of the astragalus with the os calcis. The posterior margin of this facet was fractured by the forcible rotation of the astragalus, which had also caused the bone to give way at its weakest part, the neck, the position in which fracture in such cases is generally found to occur.

The margins of the trochlea, and of the external articulating surface of the astragalus, were also partially visible. In the superior and posterior part of the wound the extremity of the fibula was bared, and hanging loose from it was the middle fasciculus of the external lateral ligament, which had dragged along with it the portion of the os calcis to which it is attached. In the anterior angle of the wound the extensor tendons were seen exposed, whilst behind and beneath the peronei tendons were stretched tensely across the wound.

Neither the tibia nor fibula was broken at any part, and this is usually the rule in this form of injury, whereas after dislocation of the ankle inwards, the fibula almost inevitably gives way, and the tibia is frequently fractured as well.

A very accurate representation of the injured limb, and of the relative position of the parts in the wound, is afforded by Fig. 1, Plate III. The lithograph is copied from a drawing taken by Mr. Molloy, one of the hospital pupils. In the interval which elapsed before everything was got ready, I made a sketch of the injury, which was subsequently copied by Mr. Molloy. It faithfully delineates the deformity and the displacement of the different portions of the foot, before surgical interference was had recourse to.

Although the patients age, appearance, and previous habits, were not the most favourable, I determined, with the concurrence of my colleagues Drs. Murney and Gordon, who were present, to excise the astragalus, and, if possible, preserve the limb.

The patient was made to inhale chloroform for a short time, and then the remaining connexions of the astragalus with the foot were readily divided with a few strokes of a scalpel, and the body of the bone was removed. It was then ascertained that the head of the astragalus remained undisturbed in its articulation with the scaphoid. It was not interfered with, nor could it have been excised without extreme difficulty, and the risk of inflicting yet further injury. The foot on being replaced was drawn up by the muscles of the leg with great force, against the under surface of the tibia, so much so that it was found very troublesome to extract some small pieces of bone which had been broken off the posterior border of the astragalus. No vessel required ligature. Strips of wet lint were applied around the injured joint and were soon saturated with the blood which oozed from the wound. The limb was then put up in Cline's splints, carefully padded in order to maintain the parts free from motion, the foot being placed in a position at right angles to the leg.

A full opiate was ordered to be administered in the event of much restlessness or pain.

Next day, the 10th, the leg was suspended in a swing splint as the patient had been restless, was suffering pain, and had obtained no sleep, the opiate notwithstanding.

On the 12th, an opening was made in the dressings opposite the injury, without disturbing the rest, which had formed a hard covering around the foot and leg. A good deal of sanious pus escaped from the wound, which looks sloughy. The patient is uneasy, has a flushed countenance, a rapid pulse, and complained much of pain in the limb. The leg was placed on the outer side, with the knee bent, on a padded splint, and an opening was left opposite the outer ankle, which arrangement permits the matter to flow away as fast as it is formed. The patient was ordered four ounces of whiskey, a bottle of ale daily, and good diet. The bisulphite of soda was also exhibited as a prophylactic against purulent infection. If this medicine be of any value, which is at the best somewhat doubtful, it is when administered as a preventative.

On the 14th, completely new dressings were put on, as a good deal of swelling had occurred. The margins of the wound, for the

breadth of half an inch all round, as well as nearly the whole external surface of the heel, have sloughed.

On the 17th, a large abscess, which had formed over the inner malleolus, was opened, and exit was given to a large quantity of unhealthy matter mixed with gas bubbles. The general condition of the patient is unfavourable. The pulse is 90, and weak, the tongue brownish, and the breath offensively sweet.

The almost inevitable formation of abscesses in these cases, on the side of the limb opposite the injury, was first insisted upon by Laugier, and therefore when such occur, should lead to their early detection and evacuation. It may be remembered that in the preceding case abscesses occupied a corresponding situation over the outer malleolus.

The wound and the cavity of the abscess were irrigated twice daily with a weak solution of Condy's fluid to clear away the sloughs and fetid discharge. Eight ounces of wine were substituted for the whiskey, and draughts containing four drachms of the compound tincture of cinchona in two ounces of the infusion were administered thrice daily. The bisulphite of soda was continued in thirty grain doses.

19th.—Since last report, the patient has been in a very bad way. His general condition is symptomatic of blood-poisoning, the skin is yellow, and there is profound depression, while the pulse has risen to 104, and become intermittent. To-day, there is subsultus tendinum, and the patient has had a sweating fit not accompanied, however, by a marked rigor. The discharge of fetid sanious pus, mixed with air bubbles, is very copious. The patient has lost his appetite. A solution of chloride of zinc, five grains to the ounce, was daily injected into the internal and external openings as an antiseptic, with the best effect. The wine was increased to sixteen ounces in the day, and nutriment in a concentrated form was administered in small quantities frequently.

On the 20th the condition of the patient, although still most critical, seemed decidedly improved. He appears to be battling successfully against the septicemia, which there is but too good reason to suspect exists. What effect, if any, the treatment employed may have had in inducing this favourable change I am not prepared to affirm.

The next day the report is still better, the discharge has diminished in quantity, and improved in quality. The sloughs are clearing away, and the unhealthy action is arrested. Upwards of two inches of the fibula are exposed.

Everything now went on satisfactorily. The bisulphite of soda was omitted, but the cinchona draughts were not. The appetite had improved greatly, and on the 30th April the limb was in such a promising condition that it was was removed from the splint, and placed upon a cushion. The wounds were dressed with spirit lotion, and the chloride of zinc injections discontinued. Claret was substituted for the port wine. The dressings still require to be renewed twice a day on account of the quantity of discharge.

A small piece of bone which proved on subsequent examination to be a portion of the posterior aspect of the external malleolus was removed on the 15th May from the original wound. Healthy granulations have filled up the wound, which is much reduced in size. On the inner side it was necessary to cut open a sinus at the lower end of the tibia as the pus showed a tendency to burrow up the limb.

Until the 28th May Hamilton was getting on very well, and an attempt was made to change the position of the limb from the outer side on which all along it had rested and which was suffering from the continued pressure, to the erect position. The change, however, caused very great pain, and a rigor due, as it seemed, to the suffering, was induced. The leg, of course, was replaced. For the next ten days afterwards, the patient's condition seemed almost desperate. Intense constitutional disturbance set in. Three or four rigors, each lasting about three-quarters of an hour, and followed by colliquative perspirations, took place. The pulse rose to 110, and became again very intermittent. The discharge of matter was excessive. The foot and ankle became swollen and sodden, and bare bone could be felt with the probe through the openings over both the inner and outer ankle, which freely communicated with each other across the joint. Altogether the man was so much exhausted by pain, irritation, and by the profuse discharge, that life was greatly endangered. On the 6th June the probable cause of most of these untoward symptoms was discovered in a large purulent track extending along the lower three-fourths of the fibula. I made a very free counter-opening over the middle of the shaft of that bone which allowed a great quantity of matter free exit. It had probably been contained in one of the muscular sheaths. The bone was not exposed. The patient obtained immediate relief, all serious symptoms shortly subsided, and he speedily gained strength. Three small abscesses were afterwards opened in the foot, and a piece of bone was extracted on July 11th from the internal opening, which proved to be a

portion of the anterior border of the malleolus of the tibia.   On the 25th of June the patient was permitted to rise for the first time, the leg and foot being supported upon a stool.   His recovery went on without interruption.   The discharge and the swelling of the foot diminished, and the wounds gradually healed.

On the 27th July, 109 days after the accident, the man was discharged from hospital in excellent general health.   The original wound had contracted to the size of a sixpenny piece.   On the inner side was a granulating surface, an inch and a half long, by half an inch wide.   The discharge was very slight.   The foot and ankle were still swollen, and the former is firmly anchylosed to the leg.   The patient can bear some weight upon his foot, but is compelled to use crutches.

I have extracted from a detailed account in my report book the most important particulars of the case.   On two occasions the poor fellow was on the brink of death from the serious effects of the injury, but he finally and completely recovered, and will for the remainder of his life enjoy the use and benefit of the foot which has been so happily preserved.

Three matters of practical moment are suggested by the consideration of the history just narrated.   First, would it have been practicable or proper to have reduced the astragalus.   Secondly, should the head of the bone have been removed as well as the body, a practice recommended by some, and thirdly would it have been more for the patient's advantage to have removed the foot in the first instance at the ankle joint, or performed amputation even higher up, a course still advocated by several distinguished surgeons, amongst others by Chassaignac, Guersant, Tufnell, and by Begin who says:—" J'ai vu plus d'un malheureux à qui des jambes avaient été ainsi conservées, regretter la liberté de mouvement, la sureté et la facilité de la marche, dont jouissaient ses camarades, porteurs de jambes de bois."

These are points upon which experience alone can decide.   With regard to the first, the amount of force exerted by the powerful muscles of the leg in drawing the foot against tibia would have rendered the reduction of the astragalus difficult, if not impracticable, and necrosis must inevitably have followed, in consequence of the fracture at the neck having separated the portion where the nutrient vessels mainly enter, and the bone being also displaced almost entirely from its other connexions.

This case, so far as it goes, establishes the propriety of leaving

the head of the bone undisturbed.   A surgeon who thought that to the dangers of compound dislocation, those of compound fracture were likewise added by fracture of the neck of the astragalus failed, on one occasion, in his attempt to remove the head of the bone in a case of dislocation of its body outwards, and the patient subsequently died.   To do so, in fact, is as unnecessary as it is difficult.

The third question, that of the relative merit of primary amputation and of extirpation of the astragalus, may be considered in connexion with the result in Hamilton's case.   I saw my patient in the March of the current year, eleven months after the accident, in the following condition.   The wounds were long since quite healed, the swelling in the limb had subsided, and there was neither pain nor uneasiness in it.   The joint was quite anchylosed, but there was already some compensating movement in the medio-tarsal articulations.   The most important fact however is that Hamilton can go about without the assistance of a stick, with comfort to himself, and with only a slight halt.   He is daily gaining fresh power. The limb on measurement appears shortened one inch, but the man does not find it necessary even to wear a high heeled shoe.   The second figure on Plate III. represents the foot in its present condition and also the portions of bone that were removed from it.   Plate IV. copied, as well as the preceding figure, from a photograph, serves to give an idea of Hamilton's general appearance and age, and demonstrates how little appreciable deformity remains, and how little the functions of the foot have been impaired by one of the severest injuries which could have befallen it.   I do not think a result such as this has been attained at too great a cost, although as was said by Hildanus of his case published in 1608—which is, I believe, the first upon record of extirpation of the astragalus for compound injury—" Curatio difficilis fuit dolorosa atque longâ."

It is a saying oft quoted, but none the less true, that it is better to live with three limbs than to die with four.   In other words the safety of human life should be paramount to every collateral consideration.   It has, however, I think been established by Broca in his exhaustive papers on dislocations of the astragalus, and his views are endorsed by Malgaigne and others, that primary excision of the astragalus for dislocation of the bone is less dangerous than primary amputation performed for a similar injury, while secondary excision of the bone is hardly dangerous at all.   Broca has collected 86 cases in which the astragalus was excised.   In 59, immediate removal of the bone was had recourse to, with a fatal result in 17 instances.

PLATE 4.

Dᴿ W. Mᴀᴄ Cᴏʀᴍᴀᴄ ᴏɴ ᴛʜᴇ Tʀᴇᴀᴛᴍᴇɴᴛ ᴏꜰ Iɴᴊᴜʀɪᴇꜱ ᴏꜰ ᴛʜᴇ Aɴᴋʟᴇ
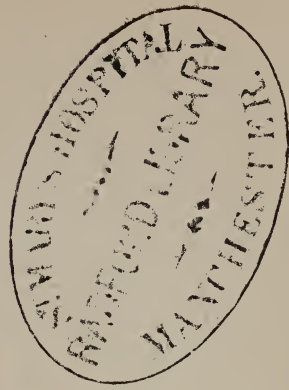
In the remaining 27, secondary extirpation of the astragalus was performed, and in no case did death ensue. Broca also reports five examples of primary amputation performed for this form of injury, of which three proved fatal. Although five cases constitute too few a number from which to form a general induction, these statistics must be admitted to possess an important relative value, for after amputation and extirpation, alike, surgeons are unwilling to publish unsuccessful results. Primary excision of the astragalus gives one failure in every three or four successes, and amputation would certainly not prove more fortunate, while if the cases of secondary ablation be included, the proportion of successful cases would be very much increased. Besides, by one method the foot is preserved, while the other necessitates a more or less costly and inefficient apparatus to replace it. Of course when the injury is very extensive, when the age and constitution of the patient are unfavourable, or when complications of a severe kind ensue during the treatment, amputation becomes advisable.

The only open question is how far a useful limb can be preserved, and at what cost. In Hamilton's case, I maintain that the usefulness of the foot has not been essentially impaired, and that the time which elapsed during treatment was not too long in order to attain to so desirable a consummation. I do not think, had Syme's operation or some modification of it, as Mr. Tufnell so strongly urges, been performed, that the result would have proved equally satisfactory. It is not at first sight apparent that in the majority of cases a wooden leg or an artificial foot, is worth more than a limb which has simply been deprived of its astragalus.

The treatment, which was based throughout on general surgical principles, need not be further particularised. I should merely wish to quote in conclusion, as being here peculiarly apposite, the words of the eminent French surgeon, Jarjavay, who, when speaking of a precisely parallel case, says:—" Le meilleur appareil est la solicitude du chirurgien."

Art. XV.—*Diseases of the Eye in Cerebro-Spinal Meningitis.* By
  Henry Wilson, F.R.C.S.; M.R.I.A.; &c., &c.

Amongst the complications of cerebro-spinal meningitis, affections
of the eye and its appendages are not at all unfrequent, and numer-
ous examples have occurred during the prevalence of that disease,
which has been, and still is, unhappily epidemic in this country.

The *eyelids* sometimes swell enormously, and present the appear-
ance witnessed in purulent ophthalmia or suppurative inflammation
of the eyeball.   This condition of the lids is, as a rule, indicative of
intense inflammatory action within the globe; they are sometimes
found retracted, so that a part of the globe remains exposed.   This
exposure of the globe is, I think, analogous to the *lagophthalmus
cholericus* witnessed occasionally in cholera, and is accounted for by
the orbicularis muscle being paralyzed, and by the rapid atrophy
and lessening in bulk of the adipose tissue of the orbit, in conse-
quence of which the eyeball falls backward; the eyelid, losing its
natural support, falls backward into the hollow produced between
the globe and the orbital margin.   I am inclined to think that
there may be also a spasmodic retraction of the upper lid.   A
medical friend informed me recently of a very rapid case of cerebro-
spinal meningitis to which he was called, but which had terminated
fatally before he arrived.   In this instance the upper eyelid on one
side had remained wide open and drawn upwards, even after death;
and when pushed down and placed *in situ* returned to its abnormal
position with a jerk.

Conjunctivitis has been frequently observed, and is recorded as
of constant occurrence in some epidemics abroad; it is either of a
mild character, with scanty mucous secretion, or of a severe type,
with profuse purulent discharge.

The *cornea* is often the seat of inflammation; it may become
ulcerated from enervation and exposure to the atmosphere as occurs
in cholera, or it may be the seat of interstitial deposit, and it may
be occasionally so extensively infiltrated with lymph as to obscure
completely the anterior chamber and iris.

The *pupil* frequently remains quite normal, it is often oval from
above and within downwards and outwards, or it may be sluggish,
and be slightly influenced by light; it may be contracted or dilated,
and may vary; thus, at one period of the day it may be dilated,
while at another it will be contracted.

The *anterior chamber* is sometimes found partially or wholly occupied by lymph or pus.

The *choroid*, *iris*, and *ciliary body* are the structures most frequently attacked; these parts (which, virtually are one and the same continuous structure) become inflamed, infiltrated, and swollen, and pour out an exudation of serum, lymph, or pus. The effusion may be between the choroid and retina, and cause separation of the latter, or into the vitreous chamber, or into the chamber of aqueous humour. The iris may be primarily or secondarily attacked; it is seen discoloured, with lymph or pus on its surface, the pupil contracted and blocked up with exudation matter. As a consequence of this the capsule of the crystalline lens becomes opaque and the pupil adherent to it. It will be readily understood how blindness must almost inevitably ensue on these processes. The premonitory and concomitant symptoms of this chorido-iritis may be mild or severe, and consist in zonular vascularity of the globe, œdema and swelling of the eyelids, chemosis of the conjunctiva, opacity of the transparent media, or even temporary protrusion of the eyeball.

The following very brief notes of a few cases may illustrate the above remarks:—

1. A boy, aged thirteen, attacked, in 1866, with cerebro-spinal meningitis, for which he had been treated by the family physician by leeching, blistering, and mercury; three days afterwards the eyelids swelled, the conjunctiva became vascular and red, and the cornea subsequently became hazy. A week after the commencement of the disease, when I was called in in consultation, the cerebral symptoms had greatly subsided on each side, the eyelids were slightly swollen, the conjunctiva somewhat chemosed, the cornea presenting parenchymatous keratitis, completely opaque, and of a yellowish grey colour; the epithelial layer, however, was clear and polished, but all the deeper lamina infiltrated with lymph in an annular manner; thus the centre of the cornea was perfectly opaque; and external to this were alternate circles of dense opacity and semi-transparency; the anterior chamber and iris were quite invisible, even by focal illumination; the boy had barely perception of light. A mercurial cap was ordered; iodide of potassium, and bark and claret, and sulphate of atropia solution to be dropped into the eye three times a day. I saw the case several times subsequently in consultation, and on one occasion found some pain and

effusion in the knee joint.   In a week's time the cornea began to clear, and the pupils were found irregularly dilated, with membraneous bands stretching across; the fundus of the eye was quite obscured, and gave no reflection of light on ophthalmoscopic examination.   Bromide of potassium, and bark, and change of room, were ordered, and the boy rapidly improved.   Three months subsequently I found numerous patches of pigment on the capsule of the lens, and points of adhesion between the iris and capsule, and two or three narrow annular and semicircular opacities in the cornea; the optic disk and a few vessels definable on the left fundus, but the right fundus obscured.   With the left eye the boy reads small type, whereas with the right he can only see large objects.

This case, of almost complete infiltration of the eyeball with lymph, illustrates well the very great advantages of atropia; for had it not been employed blindness must have been inevitable, as the pupil would have remained adherent to the capsule, which would have become opaque.

2. A boy, aged two years, under the care of Professor M'Dowel, in the Whitworth Hospital, with cerebro-spinal meningitis and spots over the body.   About a week after the disease commenced the lids of the right eye swelled, the conjunctiva became very red and chemosed, and vision extinguished.   When the child was admitted the spots had disappeared; the cornea was completely normal; the iris discoloured and adherent to the opaque capsule. A week subsequently got a relapse of the inflammation, and the surface of the iris became covered over with lymph; this subsided after a few days; the eye is quite blind.

3. A girl, aged eleven, under Professor M'Dowel, in the Hardwicke Hospital.   Eight days from the first attack of the disease the right eye was attacked with violent pain; iritis commenced, and lymph was effused into the anterior chamber, and vision almost immediately lost: the lymph was quickly absorbed, and the iris became discoloured, but the pupil, although not adherent, was inactive either to light or atropia.   A fortnight after this ocular attack she got another attack; the lids swelled greatly; there was intense chemosis and great pain; and after a couple of days the cerebral symptoms became very much worse, and she became comatose.   She finally recovered, but the globe collapsed about a month after the eye was first attacked.   This, I have no doubt,

was a case of chorido-iritis, with effusion, destroying the integrity of the retina. I was not, however, able to make an ophthalmoscopic examination.

4. A female, aged nineteen, under the care of Dr. Banks in the Hardwicke Hospital. When admitted, a week after the attack of cerebro-spinal disease had commenced, the right eyelids were somewhat swollen and closed, and a muco-purulent discharge oozing from between them; a circular ulcer was situate at the centre of the cornea, and a good deal of zonular vascularity existed. This girl recovered completely, and has excellent vision.

5. A man, aged twenty-one, with cerebro-spinal meningitis and large dark-coloured petechiæ, in the Hardwicke Hospital, under the care of Dr. Gordon, had intolerance of light from the commencement of the illness. On the fifth day the right cornea became hazy, and on the seventh day opaque, and commencing to ulcerate. The opacity appeared to be confined to the external epithelial layer of the inferior third of the cornea, and the adjacent conjunctiva was dry and hazy; the upper part of the cornea was quite transparent and free from all disease, and the internal structures of the globe were healthy. As the patient lay in bed, asleep or awake, he presented a remarkable appearance; for, while the left eyelids were naturally closed and the globe concealed, the eyelids on the right side remained open, exposing that portion of the cornea which was the seat of the opacity. The eye was sunken, and a deep sulcus existed between it and the orbital margin, into which the upper eyelid had fallen; there existed also some paralysis of the orbicularis muscle; and during the patient's convalescence slight facial paralysis was remarked; the man appeared unable to close the eyelids. On the fifteenth day effusion occurred into the knee joint. A thin light compress bandage was applied by Dr. Gordon over the right eye, and the cornea became transparent. I regard this case as identical with *lagophthalmus cholericus*.

A remarkable feature in all these cases is that the right eye was the one affected.

Amaurosis is not an uncommon sequence of cerebro-spinal meningitis, and is due to disturbances within the cranial cavity and pathological changes in the cerebral substance; it may be temporary or permanent.

The disease most frequently met with, and most fatal to vision

in this epidemic is, according to my observation, acute and rapid choroiditis, with effusion; and I am inclined to attribute that condition to metastasis, similar to what I have seen occur in puerperal fever and other pyemic affections, where not only the eye but the joints and other localities were the seat of infiltration.

The only local remedy that is of service is the sulphate of atropia, which should be employed twice or three times a day. As far as the general treatment is concerned, it should be similar or subservient to that adopted for the original malady. Practitioners are, I believe, still at variance as to what that should consist in. I may remark, however, that opium has been found highly efficacious in some of the Continental epidemics, and I have seen it produce undoubtedly the most beneficial effects.

Art. XVI.—*On the Form of Depraved Appetite known by the Name of Pica.* By Arthur Wynne Foot, M.D., T.C.D.; Fellow of the King and Queen's College of Physicians. Read before the Medical Association of the College of Physicians.

Having lately had under my observation some instances, in children, of the diseased condition of appetite called pica, I was led to enquire into the causes of this strange propensity to swallow substances universally admitted to be of an innutritious character. Although the name of pica applied to this depraved form of appetite is an old one there is not much information on the subject in books; and, therefore, the remarks on this affection by Dr. F. Battersby,[a] Sir D. Corrigan,[b] and Dr. Wm. Moore [c] are the more interesting and valuable. The term applied to this affection is borrowed from pica, the Latin name for a chattering, greedy bird, supposed to be either the jay or magpie. The bird is mentioned in the *Aves* of Aristophanes by its Greek name, κίττα, which word also bears the abstract signification of the longing of pregnant women, a false appetite, a craving for strange food. The list of substances which have been eaten in pica is a very extensive and miscellaneous one: comprising clay, sand, cinders, lime in various forms, slate-pencil, coal, twine, brick, pottery, sponge, and many other things. This

[a] Dublin Quarterly Journal, Vol. vii., p. 316.
[b] Dublin Hospital Gazette, Vol. vi., p. 225.
[c] Dublin Hospital Gazette, Vol. viii., p. 33.

form of depraved appetite is not confined to the period of childhood,
it has also been observed in adult males, in pregnant women, and
in females suffering from suppressed or deranged menstruation,
particularly about the time when that function is first established.[a]
Under the name of pica, Paulus Ægineta, in his first book on
hygiene, refers to the diseased appetite which may occur at certain
periods of pregnancy, when, he says, women have a desire for com-
plicated and improper articles, such as extinguished coals, cimolian
earth, and many more such things; and adds, that the affection is
so called either from the variety of colours which the bird, pica,
possesses, or from its being subject to this complaint. Volpato,
who has described the pica endemic in certain parts of Italy under
the name of allotriophagia[b] (ἀλλότριος, φαγεῖν), shows that, in early
life sex does not predispose to this disease, since, of 226 cases which
he collected, 111 were males and 115 female. In this country the
affection among adults is almost wholly confined to females,
chlorotic and pregnant women being the usual examples. In
twenty cases Volpato observed that the disease was hereditary,
having been transmitted to their offspring from parents themselves
subject to it. Pica is to be distinguished from another morbid
condition of the appetite, bulimia, the subjects of which, under the
influence of ravenous hunger, will devour, almost indiscriminately,
whatever presents itself, provided it be in any degree of a nutritive
character. Burserius, in his *Instituta Medecinæ*,[c] draws attention
to this distinction. In bulimia quantity is generally the desired
object; in pica the quality of the food seems a point of selection
with the appetite; hence, in the former organic matter in some
shape or other is sought for; in pica it is usually mineral matter,
often of a completely inert nature, such as silica, talc, aluminum,
which is swallowed. Bulimia occurs in its most extreme degree
after long involuntary fasting, when substances are willingly
devoured which nothing but the love of life would otherwise induce
people to eat; while pica has been observed in the well-fed as well
as among the poor, and may even exist with anorexia and distaste
for the usual food. The aberrations of appetite observed from time
to time in the insane seem related to bulimia rather than to pica,
since their desires are not confined to food of a mineral nature, but
filth of every kind, the materials of their dress or bedding, or even

[a] Montgomery—Signs and Spts. of Preg., p. 280.
[b] Brit. and For. Med. Ch. Rev., No. iii., p. 254.
[c] Vol. viii., p. 23.

their excrement is occasionally eaten. The lower animals are subject to eccentricities of appetite, which, in Germany, have been described under the name of pica, and which almost always indicate disease. Sheep, under certain conditions, exhibit a tendency to eat the wool off themselves and each other; hair concretions form in their stomachs, in consequence, and they do not thrive; they have to be separated and the wool smeared with bitter and disagreeable sub- atances.[a] Among the early symptoms of rabies in sheep and dogs a depraved appetite is conspicuous. Lambs, soon after they are weaned, are subject to a disease in which the blood becomes very watery, the red corpuscles often scarcely amounting to one-fifth of their normal quantity; and such lambs have been observed eating sand in large quantity; as much as three pounds of sand has been taken from the cecum and other intestines, the latter being nearly blocked up with it. Dr. Crisp,[b] in reporting upon this "lamb disease," considers that the tendency to eat sand is similar to that observed in chlorosis; and that it is connected with a vitiated con- dition of the blood.

Limiting, then, the term pica to those cases of depraved appetite in which the substances craved for are, for the most part, of an earthy or mineral nature, the next considerations are the effect which the practice of eating such substances has upon the body, how the habit is acquired, and how the tendency to it is to be obviated. The mass of evidence on the subject is wholly against the wholesomeness of the custom. The example of certain clay- eating tribes is often quoted in support of the habit; but an in- vestigation into the results of pica, in places where it is endemic, proves that it is most injurious. The period during which the Ottomacs eat their ferruginous loam is not long; and Humboldt states that other tribes in South America do not fail to become diseased from this habit. The emaciating effects of a clay-diet are well known to the Javanese, among whom leanness is considered fashionable; and to make themselves thin the men and women— especially the pregnant women—are said to eat toasted cakes, made out of a reddish clay which contains iron.[c] John Hunter, writing on some of the diseases of the negroes in Jamaica, where pica is endemic, alludes to their propensity to eat clay, and to its effects upon them. Dirt-eaters, as he calls them, can seldom or ever, he

[a] Ed. Vet. Rev., Vol. v., p. 128.
[b] Ed. Vet. Rev., Vol. v., p. 624.
[c] Burdach—Traite de Phys., Vol. ix., p. 260.

says, be corrected of this unnatural practice; for their attachment to it is greater than even that of dram-drinkers to their pernicious liquor. They have a predilection for particular kinds of earth at first, but in the end will eat plaster from the walls, or dust collected from the floor when they can come at no other. They are fondest of a kind of white clay, like tobacco-pipe clay, with which they fill their mouths and allow it to dissolve gradually, and express as much satisfaction from it as the greatest lover of tobacco could do. This practice is common at all ages, even almost as soon as they leave the breast, the young learning it from the old. Whatever the motives may be that induce them to begin the practice, it soon proves fatal if carried to great excess. There are instances of their killing themselves in ten days; but this is uncommon; and they often drag on a miserable existence for several months, or even one or two years. On many estates half the number of deaths, on a moderate computation, are due to this cause. The negroes subject to pica almost always complain of incessant pain in the stomach. On examination of the body after death there are frequently found in the colon large concretions of the earthy matter which they have swallowed, lining the cavity of the bowel, and almost completely obstructing the passage. The stomach has not presented the appearances which might have been expected, its interior being, usually, merely covered with a whitish viscid matter.[b]

The effects of pica upon children in this country, when the habit has been long continued, are emaciation, with impeded development, anemia, constipation, sometimes diarrhea, great dulness of spirits; the abdomen feels doughy and tumid, and is often the seat of colicky pains; hard substances which have been swallowed can occasionally be felt through its parietes, and have been brought away from the colon by enemata. The stomach and intestines become tolerant of the foreign bodies introduced into them in a wonderful degree, they are rarely rejected by vomiting, and perforation of the alimentary canal very seldom occurs, except in the case of chlorotic females, where there seems, as Dr. Crisp[c] has pointed out, a very probable connexion between the frequency of perforating ulcer of the stomach and the eating of such things as mortar and cinders. In a case of pica which came under my notice, where the child had been for two months in the habit of eating pieces of brick

[a] Hunter—Obs. on Dis. in Jamaica, p. 310.
[b] Mason on Mal de l'Estomac.—Ed. Med. Jour., Vol. xxxix., p. 293.
[c] Med. Times and Gaz., March, 8, 1862, p. 253.

or broken flower-pot as well as clay, the large intestine was distended with these things, and the pieces of brick had often been recognized, in the evacuations, by her mother, who said that it was thus finding them that had caused her to watch the habits of the child; these substances had not caused any inflammatory affection of the intestine. The local effects of pica are generally less serious than the constitutional, but the irritation caused by the anomalous contents of the intestines may, as Sir D. Corrigan observes, produce symptoms resembling those which usher in tubercular meningitis, hydrocephalus, or mesenteric disease.

In considering the causes, in children, of the morbid appetite called pica, it will be useful to examine the affection as it occurs in adults, inasmuch as these latter may be expected to give a better reason for what they do than children. In the dyspepsia with which the negroes of Jamaica become affected when exposed to hardship and privations, a prominent symptom is a tormenting gnawing pain in the stomach, and it is for the relief of this uneasy symptom that the sufferer betakes himself to eating some absorbent earth which affords temporary relief; negroes had been overheard urging their companions to adopt this remedy. In the remarkable case of Mary Riordan, brought before the College of Physicians many years ago, by Dr. Pickells,[a] it is stated that she had been in the daily habit of eating large lumps of chalk, having found it to mitigate a burning sensation in her stomach. Her father and brother, who were coopers, and used large quantities of this substance in their trade, were accustomed, in compliance with her importunities, to provide a regular supply of it each evening. At last, however, they desisted, having become alarmed upon consideration of the enormous quantity she consumed. She then regularly laid out whatever money she could command, in purchasing chalk privately, and those parts of it which were harder than others she contrived to soften by steeping in milk. The church-yard clay, the effects of which have made this woman notorious in medical literature, was swallowed from religious motives, and this act was not specially connected with her depraved appetite. Prepared chalk, taken in daily doses of half an ounce, has been found, in some cases, the only means of relieving excessive acidity of the stomach during pregnancy. (Ashwell on Parturition, p. 169). The capability of most of the substances eaten in pica to neutralize or absorb

[a] Dr. Pickell's Case of Insects in the Stomach. Trans. of the Med. Assoc. Vol. iv., p. 192.

any excess of acid secretion in the stomach, and to appease the
uncomfortable sensations it gives rise to, supports the suggestion of
Burserius[a] as to the connexion of this disease with what he called
an " aciditas esurina."   Various facts connected with the occurrence
of pica in children tend also in the same direction.   Of fourteen
cases of pica observed by Dr. Battersby,[b] the average duration of
suckling was twenty months, six of the cases were suckled two
years and upwards, and one of them weaned at one year, was con-
tinued at the breast for seven months, during the utero-gestation of
a succeeding child; the great tendency of milk, in protracted
nursing, to be decomposed in the infant's stomach into butyric and
lactic acids is well known; these fourteen children eat greedily of
coals, cinders, ashes, lime off the walls, dirt, paper, and even their
ordure.   Another cause of excess of lactic acid in the stomach, is
the imperfect assimilation of sugar; and among the cases of pica
observed by Sir D. Corrigan, is one in which this depraved condition
of the appetite was traced to the acquired habit of eating sugar.
On this child's having been weaned and transferred to the nursery,
the nurse in charge gave the child lumps of sugar, with the object
of keeping her quiet at night.   The morbid appetite for sugar
increased to such a degree that the child would at last take no food,
even broth, unless loaded with sugar.   From a desire to have a
lump of sugar in the mouth, the child then turned to other
substances, and was never contented unless she had something or
other in the mouth.   Clay came most easily to her, as she was
frequently in a small garden; and, when in the house, twine was the
next favourite for sucking and swallowing.[c]   Dr. Graves has
described a special form of gastrodynia associated with an abnormal
secretion of gastric acid, strong enough to leave, when vomited,
a red stain upon blue trowers; this acid dyspepsia is usually bene-
fited by a combination of narcotics and alkalies.   This method of
treatment may be said to have been instinctively arrived at by
certain tribes of American Indians, who, in anticipation of an undue
secretion of acid in an empty stomach, are said to provide themselves,
at the commencement of a journey in which they are likely to be
short of provisions, with a paste, composed of tobacco-juice and a
powder of the calcined shell of snails, oysters, and cockles, which
they eat in the absence of food.   There seems to be reason for

[a] Instit. Med., Vol. viii., p. 23.
[b] Dub. Quart. Jour., Vol. vii., p. 316.
[c] Dub. Hosp. Gaz., Vol. vi., p. 225.

believing, from the results of treatment and from the history of analogous cases in adults, that pica in children is often intimately connected with an over acid condition of the stomach, this being the cause of the instinctive desire for alkaline or absorbent substances which leads to the habit of swallowing such a number of innutritious articles. The clay-eating negroes in Jamaica find that this practice relieves the almost incessant gastrodynia, from which they suffer, even more effectually than a regular supply of ordinary food, which would not be the case if these substances merely served to allay the sensation of hunger, by mechanically filling an empty stomach; and from this and other circumstances, Dr. Mason, who studied the endemic pica of Jamaica, is inclined to consider that this habit, as observed among the negroes, instead of being a disease or the cause of disease, is actually a remedy, prescribed in a rough way, the absorbent earths made use of being only injurious from the many impurities they contain.[a]

The difficulty of dealing with the diseased appetite, pica, will depend upon the view taken of it by the person about to treat it. If it be regarded as a symptom of dyspepsia, with excess of acidity, it will generally prove amenable to combinations of antacids, with vegetable tonics and opiates—according to circumstances— as soon as accumulations in the intestines have been removed and existing complications attended to—due regard also being had to the difficulty of breaking off the use of what has almost become a necessity. On the other hand, if it be regarded merely as a pernicious habit or trick, and peremptorily forbidden under pain of punishment, the difficulty will be much greater; and the attempt may even fail. It has always been my impression that, in many cases, pica in children is rather an instinctive attempt, on their part, to prescribe a suitable remedy for an acid dyspepsia, though often in a form unsanctioned by medical authority than the result of an objectless habit. It is the opinion of some that the discipline of the nursery should be sufficient to correct the tendency without medical interference; but if the practice be really a mode of satisfying a peculiar want of the stomach it would be as cruel to cut off the supplies of the substances craved for, without providing an efficient substitute, as to punish a child for pulling the prepuce when it had a stone in the bladder, or for incontinence of urine while it was suffering from paralysis of the bladder. The experiment of treating pica by force has been made

on a large scale in Jamaica: blows, threats, promises, close confinement, have been employed to keep the clay-eaters from the clay which they had an instinctive desire to eat. Advantage has even been taken, on some estates, of the intense horror with which the negroes regard the mutilation of a body, and the heads of those who died from the effects of pica were cut off as an admonition to the survivors. All these methods, however, have proved ineffectual and have been abandoned. Opium, to allay the gastrodynia, a proper supply of food and vegetable tonics, with iron, have been substituted with such success that pica is now much more rare in Jamaica than it formerly was. In the district of Italy, where pica is endemic, the children, according to Volpato, are regarded as the subjects of witchcraft, and superstitious practices rather than therapeutical means are resorted to for their cure. The cases which I have seen were, with the exception of one, in the commencement of the practice, and therefore more easy to treat than those in which the habit has become confirmed, complications have ensued and the general health suffered. The administration of lime-water and milk, with vegetable tonics—the latter continued for a long time after apparent recovery—appeared to restore the stomach to a healthy condition.

Art. XVII.—*On the Value of Thermometric Observations in Typhus Fever; being a Thesis for the Degree of Doctor of Medicine. Read before the University of Dublin, on March 4th,* 1867. By Thomas Wrigley Grimshaw, M.D. (Dubl.); one of the Physicians to Cork-street Fever Hospital; Lecturer on Materia Medica in Steevens' Hospital.

ON THE VALUE OF THERMOMETRIC OBSERVATIONS IN TYPHUS FEVER.

THE use of the thermometer as a means of diagnosis has for some time past attracted considerable attention, and has even been relied upon by some as an exclusive means of diagnosis between different forms of fever. In the *Medical Press and Circular*[a] I pointed out how this instrument might be of value in determining, in doubtful cases, whether a febrile affection was likely to prove of a serious nature or not; at the same time I showed that thermometric

[a] Medical Press and Circular, January 24, February 7 and 21, 1866.

indications must be received with considerable caution. I now propose to treat of the value of thermometric indications in a single disease, believing that the best way of utilising any observations is to confine them to one disease at a time; and having thus determined the conditions in each disease, *then* to contrast them one with the other. Having collected a large number of observations on typhus fever, I am about to state the conclusions they have caused me to arrive at, trusting that similar and more extensive series of thermometric observations may in time be made by myself and others, giving us the means of making more accurate comparisons than we have at present. Perhaps it may be said that there are already a sufficient number of observations from which to draw very decided conclusions; my experience, however, leads me to the belief that few diseases have as yet been observed so frequently and accurately as to enable us to come to such conclusions. I believe some of the most accurate and numerous observations have been made by Drs. Compton[a] and Warter,[b] both of whom have published valuable and interesting papers upon this subject. I must not be considered to undervalue in the least these useful additions to the thermometry of acute disease. In fact, to my mind, they are the best papers upon these matters which have yet appeared, not excepting those of Wunderlich, who usually gets the credit of introducing the thermometer into medical practice, although it has been extensively used by others, many years since; as by Dr. George Kennedy, in Cork-street Fever Hospital, and forty years ago by Dr. M'Donnell, of Belfast, whose notes of temperature in disease accumulated by thousands on loose slips of paper (described to me as " barrels full"), in utter confusion, consequently lost to medical science.

The attention of the profession, and especially of its student members, has been called to the subject of thermometry in disease by Dr. Aitken, of the Army Medical School.[c] Unfortunately the range of temperature given by Dr. Aitken for typhus, in his work on the practice of medicine, is quite erroneous, as has been proved by the observations of Drs. Warter and Compton in London, Dr. Perry,[d] in Glasgow, and mine in Dublin. In the *Medical Press*

[a] Temperature in Acute Disease. Thesis for M.D., read before the University of Dublin. Dublin Quarterly Journal of Medical Science.
[b] Remarks on the use of the Thermometer in Acute Disease. St. Bartholomew's Hospital Reports. Vol. ii. 1866.
[c] Science and Practice of Medicine. London, 1864.
[d] Observations on the present Epidemic of Typhus. Glasgow, 1866.

and Circular I endeavoured to account for the discrepancy between my observations and those of Dr. Aitken, by the difference in the types of fever he had met with in England and I had encountered here, but since the observations of Drs. Warter and Compton have been published, I can come to no other conclusion than that Dr. Aitken has in some way fallen into error, either by taking Wunderlichs observations as a basis, or by relying too much upon temperatures taken by others[a].

Before making any remarks upon the abnormal ranges in temperature found in typhus, I wish to refer to what I consider the normal range of health. I think we may consider 98° to 98°·5 as the average temperature of the healthy body. Various circumstances may raise or lower it a little. It is more likely to be lowered than raised, as for instance after a full meal. I have met with several persons in whom the normal temperature seemed nearly always to range between 99° and 100°, and one or two where it seemed to be usually about 97°. I consider that 98°·5 may be taken as the healthy standard; and I must say, I have seen no good reason to give the normal temperature so extensive a range (from 95°·5 to 98°·5) as Dr. Compton has done in his thesis.

With regard to the thermometric range in typhus, my observations lead in the main to the same conclusions as those arrived at by Drs. Compton and Warter. I consider the division the latter observer has made of his cases into two classes—those attaining their maximum temperatures on the 7th and 9th days respectively—of great practical value, for as I have elsewhere remarked, the former maximum indicates a more rapid recovery and less severe variety of the disease than the latter.[b]

Cases I. and II. (diagrams 1 and 2) correspond respectively with these two classes of cases.

CASE I.—Was an ordinary uncomplicated case of typhus reaching

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[a] Since the above was written I have ascertained that many thermometers made for clinical use have altered so much after being used for twelve months, that they register two or three degrees higher than they should. This is owing to the tubes not having been kept for a sufficiently long time to allow for the contraction of the glass (which always follows their manufacture), before being graduated. I have been informed that several observers have found all their observations vitiated, owing to their having used these carelessly constructed instruments.

[b] Sphygmographic Observations on the Pulse of Typhus.—Dublin Quarterly Journal of Medicine, Feb. 1, 1867.

the maximum temperature on the 7th day, and being convalescent on the 15th day.

CASE II.—Was one of typhus running a long and tedious course, reaching the maximum temperature on the 9th day, and not being considered in a state of convalescence until after the 29th day. I find that the maximum temperature is usually attained *before* the 9th day (as I have already pointed out in my sphygmographic observations on the pulse of typhus), whereas Dr. Warter considered that it is usually attained *on* that day. I think these differences are easily reconcilable owing to typhus being a more severe disease in London than in Dublin. The extreme height of the thermometer in typhus seldom exceeds 104°, occasionally reaching to 104°·5, but only in exceptional cases rises to 105°. It is probable that in the cases I have mentioned when the normal temperature appeared to be high, the range during typhus would reach considerably above 104°.

Age has a considerable influence in modifying the thermometric range in typhus. In the young the range is higher than those advanced in life. The highest ranges I have, have been always about puberty, or between that age and twenty years, except under circumstances which I shall state presently.

In the young, the female sex has an influence favourable to a high range; the highest ranges having been always taken in girls of from fourteen to sixteen years of age, as in Case III., diagram 3, where the unusually high temperature of 105° degrees was reached on the 9th day, although the case was such as to give no serious cause for anxiety. The patient had been a healthy girl, and there was no complication in the case, save very slight bronchitis on the 12th day.

The value of thermometric indications as a guide in diagnosis, prognosis, and treatment, depends upon their correspondence with the other symptoms of the disease, and condition of the patient as to age, sex, &c.

A high range of temperature, *per se*, must not be considered an indication of danger; for instance, if it occurs in a young girl (Case III.) it is usually of little consequence, but if in a middle-aged person, or one advanced in life, it is of serious import. On the other hand a low range may be a very serious indication, as I shall presently show.

A high temperature shortly after the invasion of the disease

indicates the early appearance of the eruption, in other words, *cæteris paribus*, one of the class of cases described by Dr. Warter as having a 7th day maximum, consequently not likely to be a serious case. A later increase in temperature indicates that the case belongs to the 9th day maximum class, which in my experience are the most severe cases.

The temperature generally, though not always, rises to its maximum the day before the eruption appears, as in diagram 1, day 7. The temperature falls decidedly for one or two days before the eruption begins to fade (see diagram 1, days 9 and 10). The temperature usually hovers as it were sometimes a little above, but generally a little below, 98° before it settles at the normal standard.

It is to be noted that a range similar to that which occurs in maculated cases is sometimes found in cases without any spots, especially in children, as in Case IV. (diagram 4) which represents a case with a typhus range of temperature without any spots, but all other symptoms present. The patient was only ten years of age, and had a mother and sister ill at the same time with typhus, in both of whom the eruption was well marked.

The pulse usually varies with the temperature, about 8 or 10 beats for each degree. This rule, however, has many exceptions.

As an average thermometric range for typhus, I still think that that which I published in *The Medical Press and Circular*, and give in diagram 5, is nearly correct; if it require any modification I should say that represented by the dotted line might be considered as an amendment.

As to the significance of deviations from the usual typhus range of temperature, I consider I am justified in laying down the following propositions, the truth of which I have had frequent opportunities of verifying during my systematic and casual observations. I shall give cases in illustration of each of these propositions:—

A.—TEMPERATURES HIGHER THAN USUAL RANGE.

1. *Temperatures above* 104° *in middle or advanced life indicate*:—*Ex. gr.*

α. A serious case—Case V. (diagram 6), which was one of severe typhus such as we seldom see recover, occurring in a heavy plethoric man, age thirty-nine years. The temperature reached its maximum 104°·75 on the 7th day. There was no complication in this case, but all the symptoms of typhus were so intensely marked as to cause great anxiety as to the result.

β. A serious complication—Case VI., diagram 9, occurring in large fat woman, aged thirty-eight years, in whom the temperature rose to 105° on the 12th day, although it had previously reached 104° on the 7th day, and fallen to 102·5 on the 11th day. This sudden rise was followed by bronchitis on the 13th day, which nearly cost the patient her life, and much prolonged her case.

2. *Sudden rises in temperature with eruption remaining stationary, or declining, indicate complications.—Ex. gr.*

Case VI. (diagram 7), a boy age fifteen, although a temperature 104° had been attained on the 4th day (unusually early in the disease), and afterwards had fallen to 103°, yet on the 8th day a sudden rise to 104°·25 occurred, which was followed next day by severe pneumonia, the eruption at the same time beginning to fade.

Case VII. (diagram 8), a woman aged twenty. On the 11th and 12th days a sudden rise took place in her temperature, although her other symptoms were improving, her pulse however having increased in frequency. On the 12th day I noted " nothing to account for rise in temperature." On the 13th day she became delirious, tried to get out of bed, requiring a constant attendant to prevent her doing so. Another rise took place on the 14th day with a temporary increase of the delirium; ultimately the patient did well.

Case VIII. (diagram 9) already referred to, the rise on the 12th day indicated severe bronchitis.

3. *Long continued high temperature usually indicates a complication, generally arachnitis or delirium, especially the latter.—Ex. gr.*

Case IX. (diagram 10), a young woman, age eighteen, whose temperature stood at 104° at the time she came under my care, stated to be the 10th day of her illness; this high temperature was maintained until the 13th day, when she became furiously delirious, shouting, singing, cursing, and attempting to strike any one who came near her; so much so, that it was impossible to take any further thermometric observations upon her. She was treated with leeches to head, tartar emetic, and morphia. The case terminated favourably.

B.—TEMPERATURES LOWER THAN THE USUAL RANGE.

1. *A low range of temperature, other symptoms being serious, is a bad sign.—Ex. gr.*

CASE X. (diagram 11), a man aged forty-four, densely maculated with large dark spots, all the other symptoms of typhus being well marked, excepting that his mind was unusually clear. The disease ran a short course, the patient dying on the 10th day. The temperature never exceeded 101°·5, and never fell below 100°·25. Death in this case seemed to result from an intense dose of the fever poison.

2. *A sudden fall in temperature, other bad symptoms remaining the same, or increasing in severity indicates :—*

α. Death—in which case there is often a rise before the fatal event.—*Ex. gr.*

CASE XI. (diagram 12), a man aged thirty, with very severe symptoms, one of the most urgent being insomnia. The rapid fall on the 10th, succeeded by a rise on the 11th day, preceded death.

CASE XII. (diagram 13), a woman aged sixty, with very bad typhus, the spots large and dark, all the other symptoms severe; a fall in temperature on the 13th day, other symptoms not having improved, preceded death.

β. Complications, especially diarrhea; in fact diarrhea is the usual complication following a fall in temperature. This diarrhea may be critical as in Case XIII., or of serious import as in Case XIV.

CASE XIII. (diagram 14), a boy aged ten years; diarrhea occurred on the evening of the 12th day after a fall in temperature having been observed in the morning; this was succeeded by a slight rise the following day. The diarrhea seemed to have been critical, as the patient immediately passed to a state of convalescence.

CASE XIV. (diagram 15), a boy aged fifteen, exemplifies a severe diarrhea on the 13th day following a fall in temperature. On the

12th day again followed by well marked cholera on the 14th day. The spots remained without alteration until the cholera began to get well. A rise of temperature on the 19th day was followed by rapid convalescence, interrupted only by aparotid abscess, which gave no trouble. In this case I found the most extensive range of temperature I have ever taken, extending between 95°·75 and 104°·5 met with.

The details of this interesting case are given in *The Medical Press and Circular* of October 31, 1866.

There are several complications of typhus before which I have noticed departures from the usual range of temperature, as for instance, arachnitis, parotitis, inflammation of the ear, &c., but I have not systematically recorded a sufficient number of these to enable me to select examples for illustrating my statements. In each of the cases I have given as examples I had opportunities of systematically observing others similar, the only exception being Case XIV., which I have given an account of its great peculiarities.

The chief practical clinical use to be made of the thermometer is that it gives us a warning of the probable severity of a case, or the probable advent of a complication which otherwise might escape our notice, owing to the patient not being conscious, and therefore unable to direct the attention of the physician to an intercurrent disease which would soon make itself evident if the patient enjoyed the full benefit of his faculties. Thus being " forewarned" we can be " forearmed," and enabled to apply farther remedies at an earlier period than we otherwise could. As to prognosis we should always be cautious in declaring the probable result of any case when the temperature is still rising, or varies much from the typical ranges which I have indicated for the disease.

DIAGRAM I.

DEGREES FAH^T.

Day	Resp	Pulse
4	28	96
5	30	84
6	24	78
7	30	90
8	30	120
9	24	84
10	36	84
11	36	84
12	24	80
13	20	90
14	24	70
15	20	70
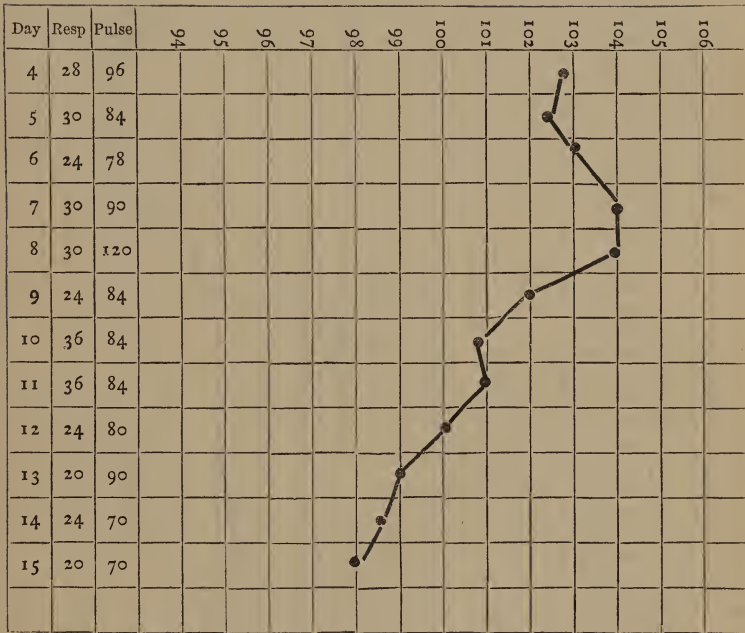
DIAGRAM II.

DEGREES FAH^T.

Day	Resp	Pulse	94	95	96	97	98	99	100	101	102	103	104	105	106
8	28	102										●			
9	28	108											●		
10	40	120										●			
11	36	120										●			
12	40	120										●			
13	40	120											●		
14	36	120											●		
15	40	120											●		
16	48	120											●		
17	36	120									●				
18	36	100									●				
19	24	90						●							
20	30	90						●							
21	36	90									●				
22	30	90									●				
23	30	90								●					
24	20	90								●					
25	—	120									●				
26	30	120								●					
27	—	102								●					
28	—	90								●					
29	—	76													
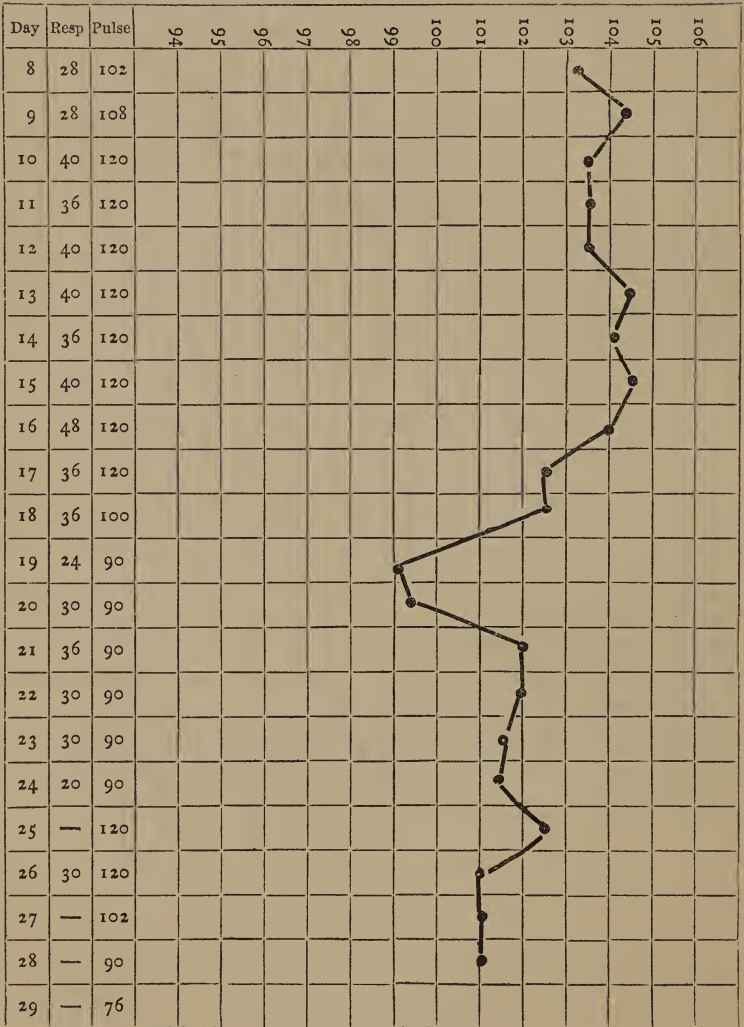
DIAGRAM III.

DEGREES FAH^T.

Day	Resp	Pulse	94	95	96	97	98	99	100	101	102	103	104	105	106
8	32	140													
9	36	132													
10	36	144													
11	40	112													
12	32	126													
13	32	96													
14	28	112													
15	21	96													
16	21	108													
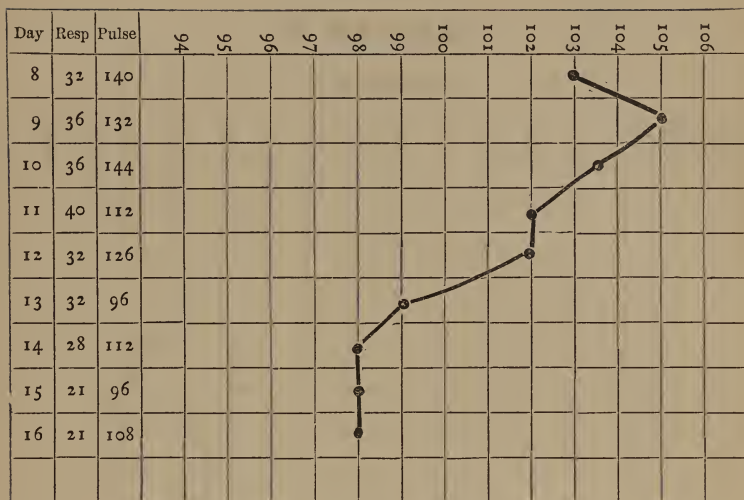
DIAGRAM IV.

DEGREES FAH^T.

Day	Resp	Pulse	94	95	96	97	98	99	100	101	102	103	104	105	106
6	—	—													
7	36	120													
8	36	120													
9	36	120													
10	30	120													
11	36	120													
12	24	90													
13	22	90													
14	20	90													
15	—	84													

DIAGRAM V.

DEGREES FAH^{T.}

Day	Resp.	Pulse	94	95	96	97	98	99	100	101	102	103	104	105	106
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
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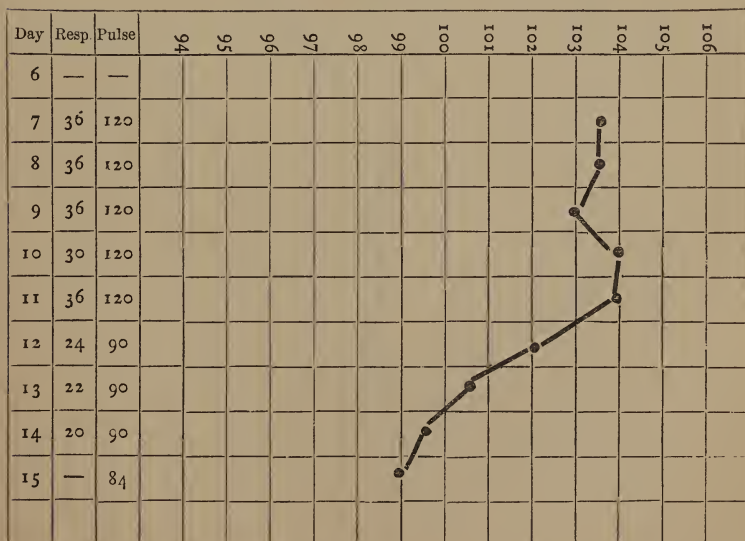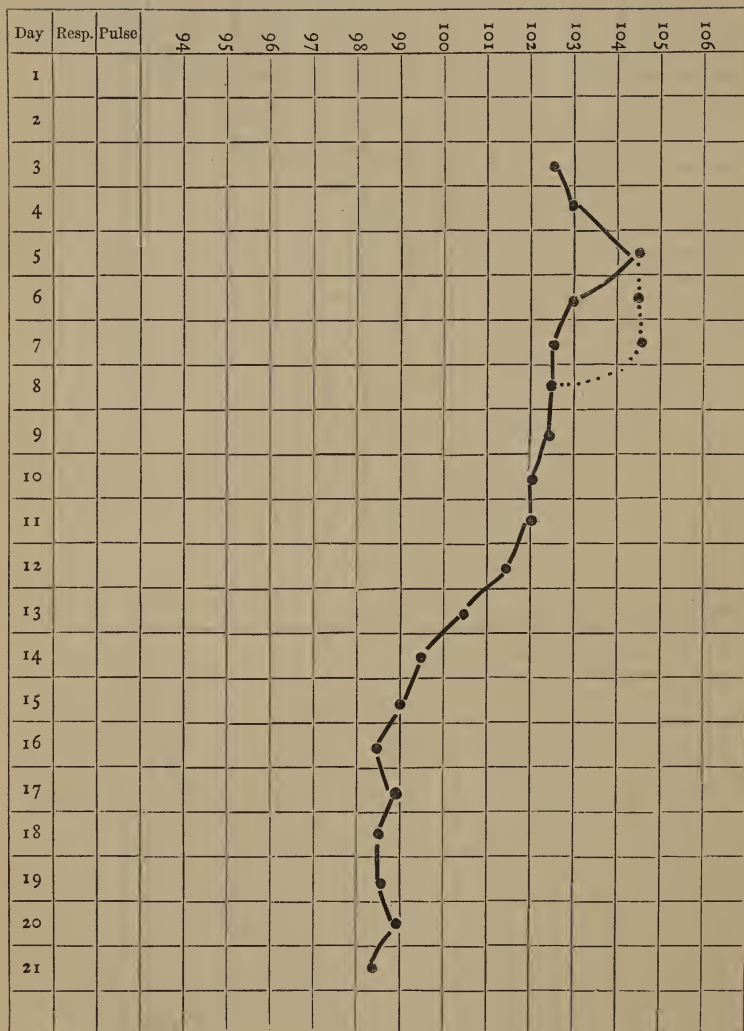
DIAGRAM VI.

DEGREES FAH$^{T.}$

Day	Resp.	Pulse
7	22	90
8	48	90
9	40	120
10	28	79
11	36	84
12	24	78
13	20	70
14	24	60
15	20	60
16	18	60
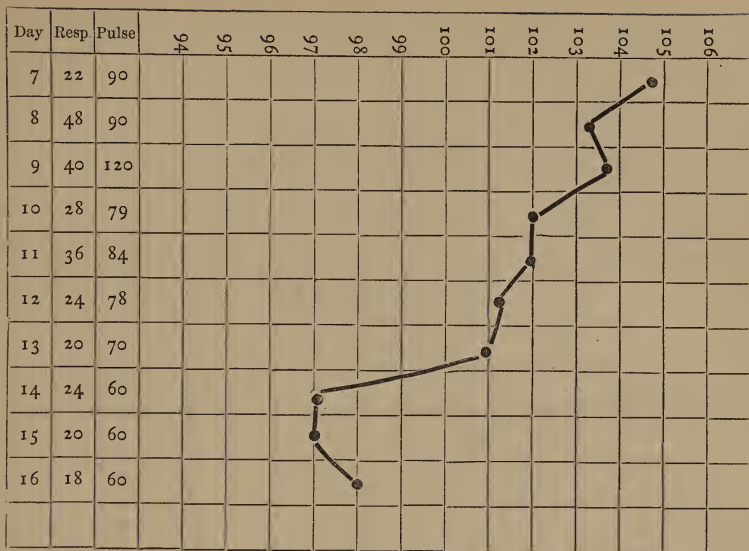
DIAGRAM VII.

DEGREES FAH$^{T.}$

Day	Resp	Pulse
1	—	—
2	26	115
3	24	108
4	36	90
5	24	100
6	40	120
7	28	120
8	48	125
9	36	120
10	34	120
11	30	90
12	36	100
13	36	90
14	28	96
15	28	90
16	20	90
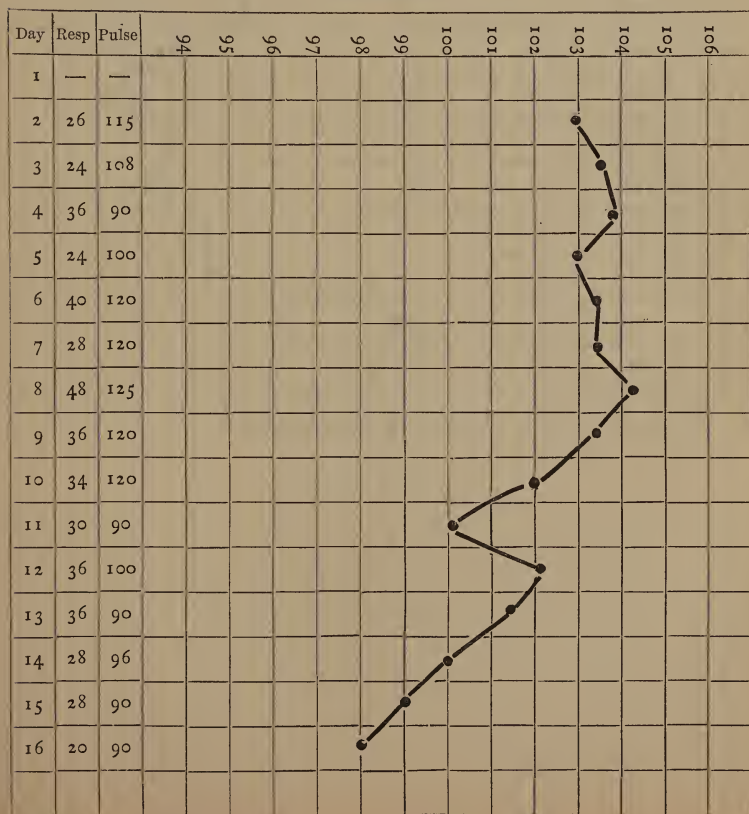
DIAGRAM VIII.

DEGREES FAH$^{T.}$

Day	Resp	Pulse	94	95	96	97	98	99	100	101	102	103	104	105	106
6	—	—													
7	30	120													
8	30	120													
9	24	120													
10	30	90													
11	38	120													
12	24	120													
13	35	120													
14	60	120													
15	32	115													
16	34	90													
17	30	90													
18	—	70													
19	—	60													
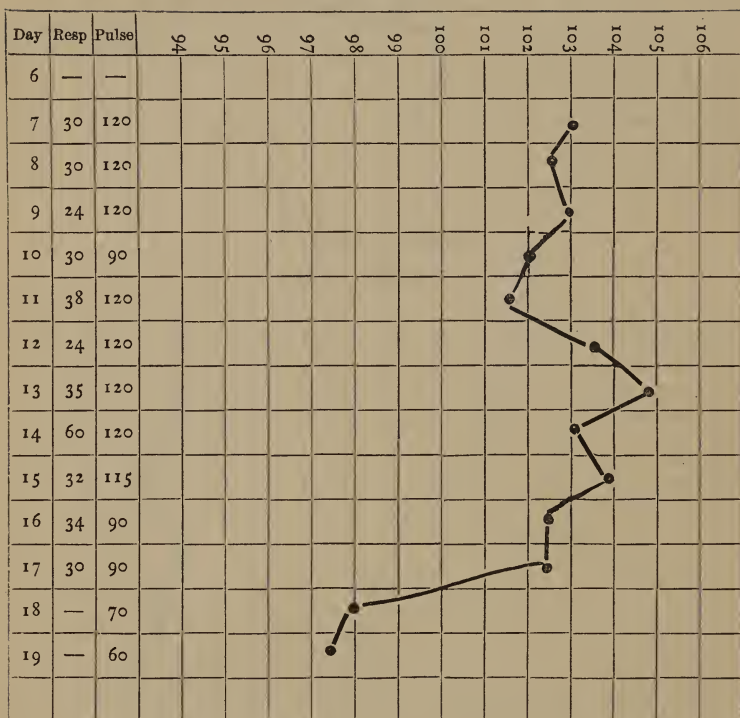
DIAGRAM IX.

DEGREES FAH^{T}·

Day	Resp	Pulse
5	38	90
6	48	90
7	44	110
8	48	114
9	48	126
10	48	120
11	60	120
12	60	135
13	60	120
14	60	120
15	40	90
16	48	90
17	60	96
18	48	108
19	60	108
20	40	100
21	40	90
22	48	90
23	40	90
—		
—		
—		

DIAGRAM X.

DEGREES FAH^{T}·

Day	Resp	Pulse
10	20	108
11	36	114
12	36	120
13	48	120

DIAGRAM XI.

DEGREES FAHᵀ·

Day	Resp.	Pulse	94	95	96	97	98	99	100	101	102	103	104	105	106
5	24	120									●				
6	30	144								●					
7	24	120							●						
8	24	150								●					
9	40	144							●						
10	36	135							●						

DIAGRAM XII.

DEGREES FAHᵀ·

Day	Resp.	Pulse	94	95	96	97	98	99	100	101	102	103	104	105	106
5 ?	—	—													
6	36	120										●			
7	60	120 ?							●						
8	50	140 ?											●		
9	48	?									●				
10	40	?				●									
11	84	?											●		
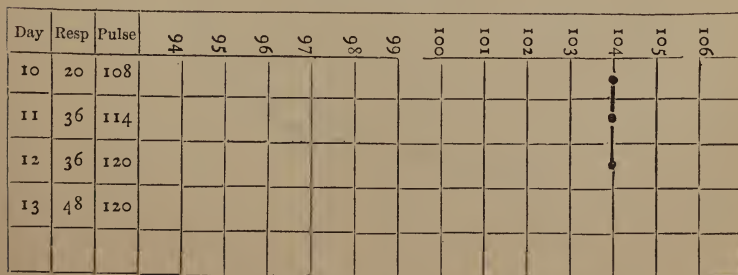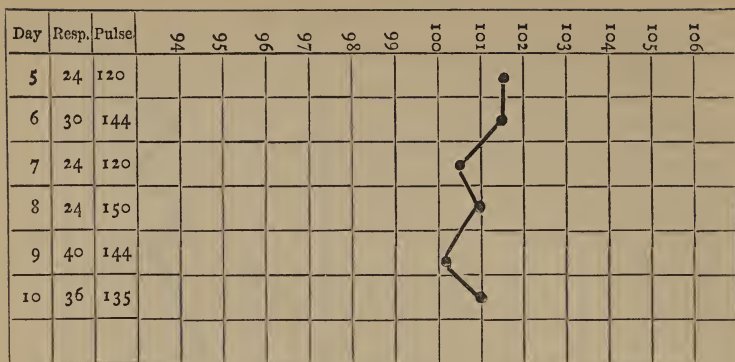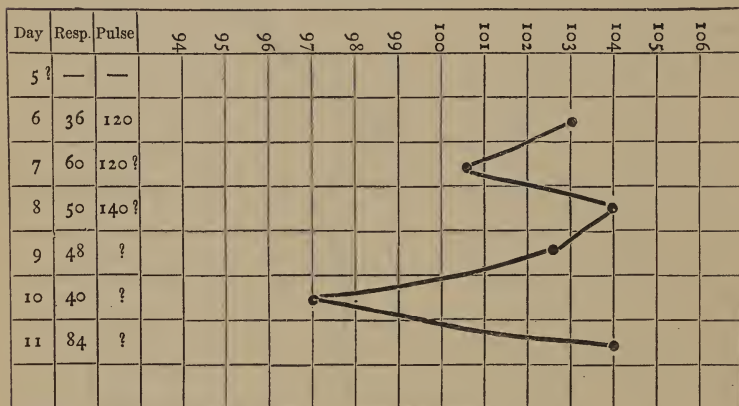
DIAGRAM XIII.

DEGREES FAHᵀ·

Day	Resp.	Pulse	94	95	96	97	98	99	100	101	102	103	104	105	106
8	—	132										●			
9	—	104									●				
10	—	132									●				
11	—	124								●					
12	—	132						●							
13	—	—		●											
14	—	—		●											
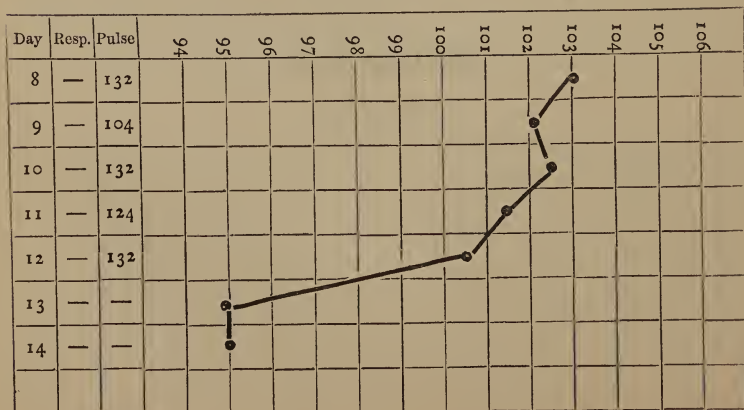
DIAGRAM XIV.

DEGREES FAH^T.
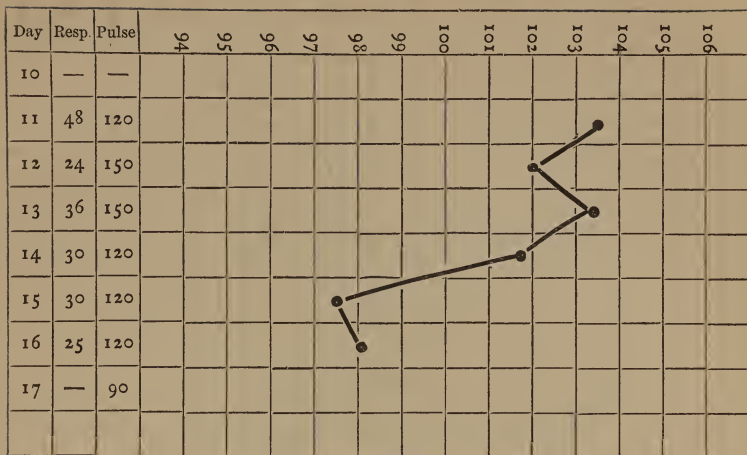
Day	Resp.	Pulse	94	95	96	97	98	99	100	101	102	103	104	105	106
10	—	—													
11	48	120													
12	24	150													
13	36	150													
14	30	120													
15	30	120													
16	25	120													
17	—	90													

DIAGRAM XV.

DEGREES FAH^T.

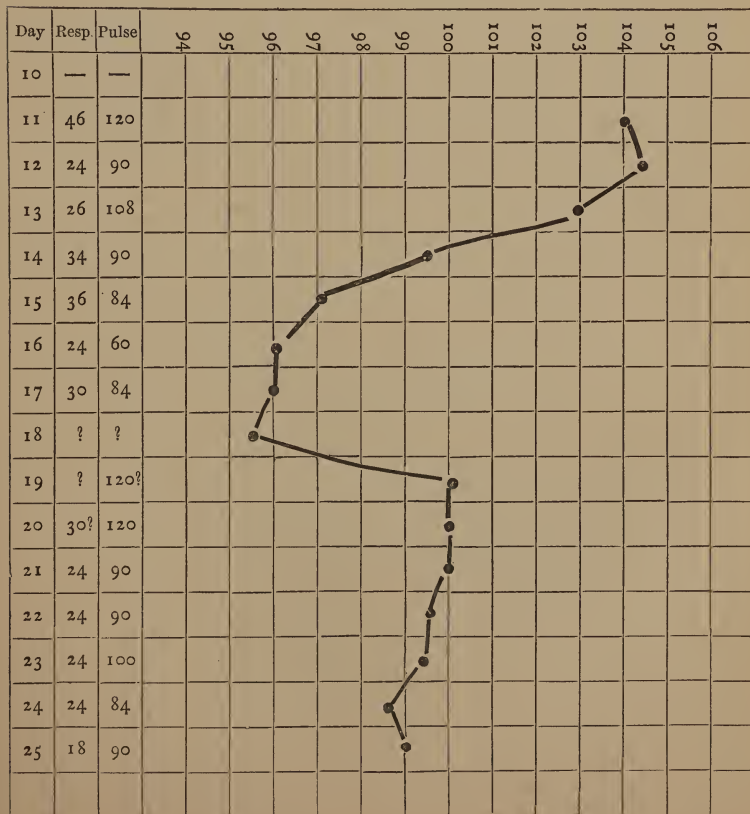| Day	Resp.	Pulse	94	95	96	97	98	99	100	101	102	103	104	105	106
10	—	—													
11	46	120													
12	24	90													
13	26	108													
14	34	90													
15	36	84													
16	24	60													
17	30	84													
18	?	?													
19	?	120?													
20	30?	120													
21	24	90													
22	24	90													
23	24	100													
24	24	84													
25	18	90													

PLATE 5.

Fig 1

Fig 2

Mʀ MAURICE COLLIS'S CONTRIBUTIONS TO OPERATIVE SURGERY

Art. XVIII.—*Contributions to Operative Surgery.   Part I.:—
Operations about the Face.* By Maurice Henry Collis, M.B.,
Univ. Dub. ; F.R.C.S.I., Surgeon to the Meath Hospital and
County Dublin Infirmary ; Member of Council of the Surgical
Society of Ireland, and of the Pathological Society of Dublin ;
Sometime Examiner in Surgery to the Queen's University in
Ireland, and Member of Council of the Royal College of Sur-
geons in Ireland, &c.

REMOVAL OF AN ENORMOUS OSSIFIED-ENCHONDROMA FROM THE FACE.

To the records of operations which have for their object the com-
plete removal of the superior maxillary bone, I should hesitate to
make additions.   In the pages of this Journal and elsewhere enough
has probably been written on the subject for some time to come.   I
have less hesitation, however, in presenting to the profession a
detailed account of an operation which has another interest, inas-
much as it differs from those to which I have alluded in being of a
more conservative character.   As will be seen, I was able in this
instance not only to preserve the palate, nostril, and floor of the orbit
intact, and so to lessen to the utmost the deformities and incon-
veniences which would otherwise have resulted, but I further was
able to preserve the periosteum of the bone throughout, and along
with the periosteum, the attachments of the muscles.   Hence, in
addition to the preservation of intelligible speech, the muscular
movements of the face, so essential to expression, have been pre-
served.   This application of sub-periosteal resection is but a further
extension of those principles which many years ago were put in
practice by the writer in operations upon the hard palate—prin-
ciples which the profession owes first to Mason Warren, of Boston,
and in their present enlarged application to Langenbeck, of Berlin.
The former, whose lead I had unconsciously followed, merely pro-
posed to himself to make use of the periosteum, combined with its
mucous covering, for ordinary plastic purposes; while to the German
surgeon is due the higher praise of perceiving that the firmness,
which this method of operating gave to the new palate, was due to
some deposits of bone springing from the periosteum.   Hence, he
quickly applied this method to other parts, with a view of obtaining

a regeneration of bone from the retained periosteum, and with the greatest success. In resections of joints in operations on shafts of bone, and generally in all cases demanding the removal of bone for disease, this sub-periosteal method is now followed by all truly conservative surgeons. It must, however, be remembered that it has the further advantage, above noted, of preserving, along with the periosteum, much of the attachments of the muscles which spring from, and are continuous with this membrane. A moment's reflection will show the wide utility of the proceeding, viewed from this point, and how important its application, whether in operations which interfere with muscles of power, as in the limbs, or with those more delicate, but scarcely less important muscles of expression, which have their attachments to the surface of the facial bones. With these prefatory observations I shall proceed to the details of my case of sub-periosteal resection of the greater part of the superior maxilla.

Early in the present year I was consulted by a gentleman, well known in this city, with reference to a tumour, which produced much deformity of the left side of his face. This gentleman is somewhat under fifty years of age ; is of active habits, and has always enjoyed excellent general health. The history which he gave me of the gradual development of his tumour was to the following effect :—

" The first indication of the tumour on my face was a slight hard swelling on the gum just by my front teeth [left incisors], which I noticed when I was probably twelve or fourteen years of age. Since that period the swelling continued to grow steadily, but almost imperceptibly, until within the last three or four years, when it developed itself with singular rapidity, and attained such formidable proportions that I became anxious for its removal.

" Ever since the first appearance of the tumour it was carefully watched by Mr. Adams, and frequently examined (at his request) by almost every eminent surgeon in Dublin, including the late Sir Philip Crampton, Mr. Carmichael, Mr. Cusack, Mr. Colles, Mr. Maclean, the eminent dentist, and others.

" The general opinion at that period seemed to be against an operation, on the ground that there was nothing malignant in the growth ; that it never would be otherwise than harmless, and because some, including Mr. Cusack, thought ten or twelve years since that it had ceased to grow. However that may be, the fact is

now undeniable that within the last ten or twelve years it has increased more than in all the previous period.

" Some years before Sir Philip Crampton's death, Mr. Adams, Mr. J. Smyly, and I were with him in Merrion Square, and he then made a puncture from the inside of the nostril into the interior of the tumour, and inserting a small tube, got out a trifling quantity of fluid, not more than a drop or two. He first endeavoured to bore through the gum, but failed, apparently from the solidity of the bone. About the same time Mr. Maclean extracted a tooth near the front [left canine], and then made some ineffectual examination with a probe, or some such instrument. I did not feel the extraction of this tooth. I may add I was always deficient by a tooth on this side. The sight of my left eye left me very gradually. It evidently went as the tumour extended, and about fifteen years ago it became completely extinct."

Such is the simple history of this growth, as written down at my request by the gentleman. I have only to add to it a very few particulars, elicited on conversing with him. In the first place the tumour from the very outset was always firm and hard to the touch, showing that, at least, its covering was bony; further, there was no pain either in the tumour itself or resulting from its pressure during the greater part of its progress; even the loss of the eye was so gradual as to be painless, any sensation amounting only to uneasiness. Within the last two years the tumour has grown rapidly forwards, and has distended the soft parts of the cheek. Browache, with shooting pains of a dull nature, have been felt rather constantly during that period. Hearing on that side has also become somewhat dull. The pressure on the left nasal cavity has made it quite impervious. Breathing is impossible through the left nostril, nor can air be forced through it to any appreciable amount. The sense of smell is necessarily in abeyance as regards this side. Even the other nostril participates in the inconvenience, so that when the gentleman is in a warm, dry atmosphere, his comfort is much impaired by reason of a dryness and stuffiness in the nasal passages, and the immediate occurrence of ache in the frontal sinus. With these exceptions he has no physical inconvenience from the tumour, nor until lately did his moral courage fail to support him in bearing, with equanimity, the deformity with which he was afflicted. Cotemporaneous, however, with the rapid increase of the growth and its commencing pressure in new and important directions, came

sensibility to observation ; and although he continued to go about the city as freely as ever on matters of business, he assured me, and his assertion was corroborated by the observation of his near friends, that the effort was painful, and that, as far as possible, he had withdrawn from positions of prominence which formerly afforded him pleasure. This is an interesting psychical phenomenon—for it must be remembered, that as far as the public are concerned, the impression produced by the size of the tumour has been at all times much the same. The sensibility to the increase of the tumour was practically limited to the patient himself, to the immediate members of his family, and to those professional friends who had him under observation. And yet, along with a development of the tumour, which, as we shall see, threatened life, there arose in the patient's mind, all unconscious of his danger, first a dislike to be observed, and as that increased, a desire and determination to get rid of the deformity. This acquiescence in the necessity for operative interference, or its opposite condition, a repugnance to the same, may be taken, in reasonable people, as a valuable aid to the surgeon where the propriety of operation is wrapped in more than usual doubt. Without laying too much stress upon it, I would certainly give it in such cases, due consideration. In the present instance the feeling was strong that the time had come when, at all hazards, the tumour must be removed.

I shall now show, by a description of the growth and its relations to surrounding parts, how well founded was this feeling, and how just these apprehensions.

Placing the patient almost in profile, and looking at him from the right side, as in the position shown in Plate I., it was observed that the tumour projected in an even curve from the floor of the orbit to the mouth, so that the prominence of the tumour extended a full inch beyond the outline of the nose. The two nostrils looked directly towards the observer, so great was the distortion of the nose. The left nostril was somewhat dilated. The outlines of the mouth were much altered, owing to the left side of the mouth being depressed, and the left side of the upper lip was much distended over the lower part of the tumour. The lower lip and upper part of the chin were thrown deeply into shadow, and also somewhat out of drawing. Upon reversing the position, as in No. 2, the great prominence of the tumour came fully into view. It occupied the whole region of the cheek, and bore upon its surface evidence of two distinct epochs of growth. If a line be drawn from the

inner angle of the left eye to the angle of the lower jaw on the same side, two distinct types of growth will be noticed, the one occupying the face above, and to the outer side ; the other below and internally. I shall take the former first, as it represents what, for want of a better term, I may call the more chronic condition of the tumour. We observe here a distinct elevation of the floor-line of the orbit; this is not due merely to an elevation or pushing up of the lower eyelid or other soft parts; the finger and even the eye could detect that the bony ridge itself was higher than that on the right; otherwise the bone in this spot was not altered in texture or outline—it was simply pushed upwards. On the outer side the junction of the maxillary and malar bones is prominently seen ; the bones here were expanded, but the body of the malar was not altered in size—it was plain, therefore, that the disease was limited in that direction. Altogether, then, it appeared evident that there was no present active extension of the growth above or outside the line I have imagined to be drawn from the inner angle of the eye to the angle of the jaw. Within this line matters were far different. Reaching high up on the nose, almost to the angle of the eye, and to the central line, a rounded mass of bony hardness, was formed. On the inner side it passed down as far as the lower margin of the ala nasi, where it was joined by a second mass which reached far down into the mouth, and which bore upon its buccal extremity two incisor teeth. Passing outwards these two portions, separated by a fissure on their nasal aspect, became consolidated together, and formed by their union a mass of great size, still rounded in outline, and of firm inelastic nature. The growth pushed the nose out of the mesial line to an extreme degree, and extended outwards and forwards, so as to distend the soft coverings of the cheek to a huge extent. On opening the mouth it was found to have extended backwards to the palate bone, and to have pushed down the palate process of the maxillary even to a greater degree than it had pushed up the floor of the orbit. Along the alveolar ridge it had grown to a greater degree than at any other part, except towards the nose. It was evident that its progress in these directions was fast reaching the utmost limits compatible with any approach to comfort, and that a little more increase would soon threaten existence. This extension downwards, and threatened extension backwards, was likely to lead sooner or later to the filling up of the cavity of the mouth. In Hey's works will be found the drawing of such a case, where the tumour developed in this direction to an enormous amount.

As it was now clear that an operation was unavoidable, I arranged to meet, in consultation, Mr Adams and Sir William Wilde. After careful examination, and a prolonged discussion, a plan of operation was agreed to, which offered the prospect of removing all the active portion of the growth with as little interference as possible with the function of speech. The gentleman's occupation rendered this proviso essential. I was under the impression that this latter object might be attained by simply preserving the muco-periosteal coverings of the palate plate and palate bone; but in this I was overruled, and I finally resolved to attempt to preserve a thin layer of bone along with the periosteum in this locality. Before the details of the operation were conclusively arranged the eye was carefully examined by Mr. Wilson, who reported that there was hopeless disorganization of the vitreous humour, and displacement of the retina, to such an extent as to show that no operation could restore sight. Blindness, in fact, resulted from the remoter effects of pressure, so that the removal of that pressure could not now restore vision. Mr. L'Estrange examined the palate for me, and came to the conclusion that the layer of bone immediately above the periosteum was sound, and that it might safely be retained.

All things being arranged, the operation was performed, on the 7th February, in the theatre of the Meath Hospital, in presence of a very large concourse of surgeons and students. This was due not so much to the severity of the expected operation, as to the personal popularity of the patient, who· is extensively known and highly respected as a citizen of Dublin. Chloroform was administered throughout by Professor Macnamara, and during the long and tedious operation, the patient only once became for an instant partially conscious. When I state that the removal of the body of the tumour occupied twenty-seven minutes, and that during nearly half of that time I was engaged at the palate, this result was highly satisfactory.

The patient was laid upon an operating table which admitted of his head being raised to any required degree. I stood in front and to the left side, Mr. Porter close beside me, and Mr. Smyly opposite to him. I have to acknowledge most gratefully the unwearied assistance they gave me during the progress of this most trying operation. My other colleagues, Mr. Wharton and Mr. Stokes, also rendered valuable aid, and Mr. Adams and Sir William Wilde, were close at hand to assist in carrying out the

plan we had agreed upon.   As a preliminary step Mr. L'Estrange
extracted the two incisors and a bicuspid which alone remained on
that side of the jaw.   I then plunged a trochar into the tumour
above and parallel to the palate, with the two-fold object of ascer-
taining the density of the bone and of making room for a strong
metacarpal saw.   The bone was dense enough, but not so dense as
to make it hopeless to work the saw.   By slow degrees a layer of
bone was separated from the floor of the tumour, partly by sawing
and partly by the elevator—once it was necessary to use a chisel
and mallet to free the saw.   I tried two or three saws, but discarded
all for the simple straight metacarpal saw.   Having effectually
separated this layer of bone from the floor of the mouth, I made a
vertical incision from the inner angle of the eye to the ala nasi, skirt-
ing the attachment of the cartilage, and continued it down through
the lip along the curved ridge which separates the outer portion of
the lip from the filtrum or central part.   I followed this line in pre-
ference to a straight cut through the lip, either vertically from the ala
nasi or in the mesial line; and for this reason, that the subsequent
contraction of the cicatrix in these lines leaves a more ugly pucker
than when it follows the line of the natural ridge.   By the help of
Langenbeck's instruments the periosteum of the tumour was easily
detached and turned aside along with the skin and muscles of the
cheek.   These being held strongly aside by my two chief assistants,
I divided the malo-maxillary symphysis by a strong bone forceps.
In the same manner the frontal process of the maxillary was
divided, the periosteum peeling off with even greater ease, so that I
was able to push it and the nose completely to one side.   I now,
with the bone forceps, divided the attachment of one maxillary bone
to the other as near the mesial line as possible.   Thus the tumour
was detached on three sides.   There remained the difficult task of
sawing through the connexions of the tumour with the floor of the
orbit.   The bone was here dense as ivory, and the labour of sawing
through it was severe and prolonged.   At length, however, after
breaking one saw this was completed, and the posterior attachments
of the tumour alone remained; powerful traction by the lion-
forceps caused these to yield, and a large mass was removed.
Above and behind it some of the less dense portions of the tumour
still lay; these were scooped out with the gouge, until all was
removed which showed the least deviation from soundness.   The
large piece weighed over four ounces; and as I removed upwards of
an ounce of smaller fragments, the weight of all fell little short of

six ounces. This, with the drawing of the section, will give some idea of its size. A couple of small vessels required ligature; and three which bled freely from the surface of the bone, and which could not be ligatured, were stopped by platina wire, heated to a white heat by a galvanic current. The battery for this purpose was kindly brought by Dr. Bennett. I found it both simple and effectual. All active hemorrhage being thus checked, I plugged the cavity with some half dozen small pledgets of lint, tightly rolled and fastened to cords which were allowed to hang out of one corner of the wound. The soft parts in the mouth were first brought together by numerous points of interrupted suture, horse hair being used for the purpose. In a like manner the wound in the lip and cheek were closed. Two points were left for the escape of pus, and for the withdrawal of the plugs and ligatures. One point corresponded to the former situation of the incisor teeth, and the other to the groove beside the ala nasi. With these exceptions the entire track of the wound was brought accurately in contact; no external dressings were applied. The patient bore the operation remarkably well; his pulse was 70 at its close, and very good in quality ; he woke up quickly from the chloroform, and had no sickness of stomach. On being removed to bed he was ordered thirty drops of Battley's sedative, and as much ice as he might wish for.

3 p.m.—He has slept well since 12 ; pulse 72, and full. There is a little sanious oozing only. He is suffering a good deal of pain, but feels inclined to sleep again. He expresses a wish for some beef-tea, which was ordered ; also to have tea whenever he wished, and ice. Iced water applied to the face.

8 p.m.—Pulse 92, full and strong—no further sanious oozing, but some discharge of saliva. He has slight nausea, attributed by himself, and rightly, to his having swallowed some blood during the operation. Ice, which relieves this sickness, to be continued. He passed water freely. The upper lip is swelling fast, and there is a good deal deal of pain about the orbit. To have ice or whey through the night.

10.30 p.m.—Pulse 90—sleeping calmly.

Feb. 8th, 1.30 a.m.—Has slept quietly for periods of ten minutes— the lip a good deal swelled.

He continued to sleep off, and on, until 4 a.m., when his stomach rejected the whey; his feet became cold, and he had a slight rigor for about five minutes. Mr. Sibthorpe, who sat up with him, put a hot jar to his feet, gave him ice, and a draught, with twenty-five

drops of chlorodyne, and two grains of quinine, in camphor mixture; this had the desired effect; he slept quietly until 8 a.m., and had no return of sickness or rigor.

At 9 a.m. his pulse was 100, full and strong ; at 10.30 I found his face a good deal swelled, especially about the lower part of the cheek.   The eyelids were much ecchymosed, but could still be opened voluntarily.   He made no complaint of pain, only of discomfort from the swelling, and from lying on his back. I allowed him to turn on his right side.   As the bowels had not been moved, I ordered three grains of calomel, with one of quinine, and one of extract of hyoscyamus ; these were taken at once, and operated in the course of the day freely, but not excessively.

At 2 p.m. his pulse was 96, and less full.   He had beef-tea through the day.

5 p.m.—Stomach again slightly sick—ordered a gargle of permanganate of potash to clean the mouth.   Ice as before.

His pulse went up to 100 in the evening, and remained at that rate through the night.   He slept well, waking but seldom, and in the morning of the 9th his pulse was again at 96, but much less full and strong.   The bowels were again moved.

At 10.30 I removed, one after another, all the plugs and the two ligatures, pulling them through the aperture left in the mouth for the purpose.   There was no consecutive hemorrhage, and very little fetor; the discharge which accompanied the plugs was moderate in quantity.   I syringed the cavity with tepid water, to which I had added spirit of ammonia in the proportion of a drachm to the pint.   He had no headache, and was inclined to eat.   Ordered—beef-tea, some light claret, and a mixture of chlorate of potash.

3 p.m.—Pulse ran up to 120 ; wine stopped.

7 p.m.—Pulse down again to 96—no further signs of feverishness; has slept.

Feb. 10.—Very moderate discharge of pus from the cavity through the mouth.   The discharge from the nasal cavity, which, it will be remembered, was not opened in the operation, is simply viscid mucus.   The swelling is already diminishing.   Pulse, 90.

Feb. 12.—Sitting up in the bed for some hours—able to eat a mutton chop cut small—going on most satisfactory.   The sutures in the lip removed.   This portion had healed with little mark.

Feb. 15.—Daily improving—swelling much abated—appetite and sleep good—pulse, 76.   The greater number of the sutures were removed from the external part of the wound.   All has healed by

first intention, except a spot at the ala nasi, which is purposely left open for the convenience of syringing out the cavity ; this is done once a day—the discharge is not profuse.   He was allowed to sit up for half an hour to-day (9th day).   Already some power is returning in the muscles of the cheek; the levator anguli oris is especially under the control of the will.

From this date to the 25th, when he left the hospital, he continued steadily to improve.   In fact, he could scarcely be said to have had a serious symptom from the first.   The slight rigor in the course of the first twenty-four hours was evidently due to his having swallowed some blood.   This, slight as it was, formed the only check in the even progress of the case, while he remained in hospital.   Subsequently to his return home he suffered from a small anthrax on the back of the neck ; this, however, yielded to the mild, yet effectual treatment by pressure, which I have now for six years uniformly adopted, and with unvarying success, in every phase and variety of anthrax.   I may here state incidentally that since I adopted treatment by pressure, or support, I have never met with an anthrax in which the disease continued to spread after the strapping was once properly applied; and I believe I have met with them in almost every possible stage and locality. In some rare cases of utterly broken down diabetics it may possibly fail to stop the gangrenous inflammation of the fascia, areolar tissue, and skin; but I presume that in such cases the knife would be equally ineffectual as a remedy.   Even in such cases the combined action of the opium and of pressure would probably check, if it could not entirely control, the destruction of tissue.

Plates III. and IV. show the appearance of this gentleman about the middle of March, six weeks after the operation was performed. Some of the delicacy which necessarily resulted from so serious an operation, is visible in these drawings, which are accurate copies of photographs, taken by Mr. Forster of Westmoreland-street.   Since then he has greatly improved.   The œdema of the nose and lower part of the cheek has subsided still further, and the cicatrix is less remarkable.   The cavity is completely closed, and there is no discharge from it.   Power is returning to the muscles of the face.

I shall now proceed to describe the tumour, and its appearance on section.   Much of its posterior part was removed piecemeal, but what remained was composed of two kinds of bone.   The centre, which may be supposed to correspond to the antrum, is remarkably
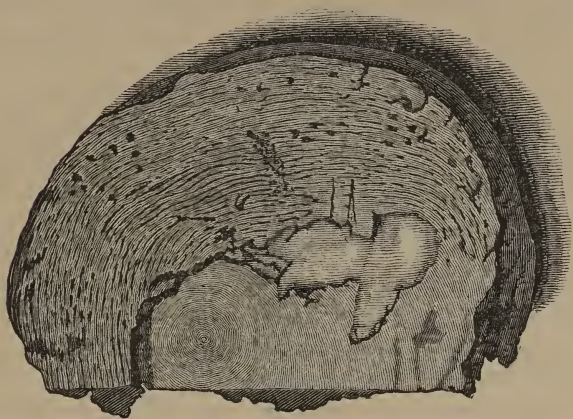
PLATE 6

Fig 3

Fig 4

Mr MAURICE COLLIS'S CONTRIBUTIONS TO OPERATIVE SURGERY

BANKS & Cº EDINBURGH.

hard and close—white, with fine concentric rings, like ivory, which it also resembled not a little in its hardness. All round this, except above, lay a much larger mass of bone, distinctly and coarsely laminated, softer in texture, and enveloped in a very thin and strong layer of hard bone. This external mass was divided into two by a fissure which ran in an oblique curve upwards and out-wards into a very small, irregular space, filled with a mass of lining membrane, gathered up and jammed together. These two masses evidently corresponded to the middle and inferior spongy bones; and the fissure and cavity represented that portion of the nostril which normally lies between these two bones. The growth commenced in the antrum, filled it, implicated its walls, extended to the spongy bones, developed itself layer over layer, until the entire nasal cavity was filled. It then continued to grow, producing the immense deformity already described. Originally it had probably been an enchondroma, but as years advanced it ossified, beginning from the centre. The outer layers of the new growth were probably the most recent, as they contained some fragments of imperfect or degenerate cartilage. The whole was enclosed within a real bony layer, derived from the proper tissue of the spongy bones and of the walls of the antrum. I had a section of the tumour made by my friend Dr. John Barker, and I have preserved one half in the Museum of the College of Surgeons. The other half I broke up for the purpose of micros-copic examination. It contained a large quantity of animal matter. When this was removed the laminæ of bone were readily separated. They lay one inside the other, either smooth, or here and there folded together, imbricated and crushed, like the unopened petals

of a rosebud, showing evidently the compressing forces which opposed their growth and development. Had these been removed, by rupture of the enclosing bony cyst, and by ulceration of the soft parts, I have no doubt a rapidly growing and fungating tumour would have been the result. I have found this happen in every form of growth, even in the simplest. Under the microscope the bony plates differed little from ordinary bone; they were a little less regular as regards the arrangement of the blood-vessels.

As regards prognosis, this may be said, that the tumour grew slowly, and had a tendency to become inert in its older parts by a process of ossification. Like the Autumn leaf, its vessels and cells became gradually filled or narrowed by increasing deposits of earthy material, and less and less capable of active growth. We may, therefore, fairly hope that as we have removed all the active parts of the growth there will be no reproduction of the disease from the hard, bony floor of the orbit. Already the margin where the saw was used has fined down and rounded away. The layer which was left with so much care along with the periosteum of the palate, vanished in a few days. I had my finger in the cavity, and found that this bony layer was absorbed five days after the operation, leaving only the ordinary periosteum thickened and granulating, but without a trace of bone. The palate, however, is now perfectly firm and efficient for all its uses. The huge cavity has been filled with soft granulations, which at first caused the cheek to bulge forward a little; but with the natural contraction and consolidation of these soft granulations the cheek has gradually fallen in to its proper level, and neither by touch nor in any other way can I detect any sign of disease. I have, therefore, good reason to hope that this tumour, which took thirty-five years to grow, may never be reproduced. The patient may reasonably look forward to a long life, free from the distress and deformity which this enormous growth formerly gave rise to.

I cannot conclude this rather lengthened detail without a word of thanks to the many friends, professional and others, who evinced an unusual interest in the progress of this case. Next to those who personally assisted in the operation, my especial thanks are due to the resident pupils of the hospital, Messrs. Russell and Tredennick, and to my apprentices, Messrs. Scott and Sibthorpe, all of whom watched the case, and noted the particulars for me almost from hour to hour. Nor can I omit to add that the quiet determination and great patience of the gentleman himself tended

very much to his freedom from dangerous symptoms, and to his rapid recovery.

<div style="text-align:center">CORRIGENDA.</div>

In Vol. xlii., page 343, first paragraph, for—

"The operation of dividing the gustatory nerve was first performed by Hilton, whose case is given in the seventh volume of the second series of *Guy's Hospital Reports.* From this paper I have taken the liberty of copying the accompanying woodcut, which explains the steps of the operation. Mr. C. H. Moore has also drawn attention to it in the *Medico-Chirurgical Transactions.*"

Read—

"The operation of dividing the gustatory nerve was first performed by Hilton, whose case is given in the seventh volume of the second series of *Guy's Hospital Reports.* Mr. C. H. Moore has also drawn attention to it in the *Medico-Chirurgical Transactions.* From his paper I have taken the liberty of copying the accompanying woodcut, which explains the steps of the operation."

Art. XIX.—*On Cephalotripsy.* By G. H. Kidd, M.D., F.R.C.S.I., Assist. Physician to the Coombe Lying-in Hospital, Dublin.

At one of the meetings of the Dublin Obstetrical Society during the present session I read a paper on cephalotripsy in which I showed that though this operation had been ignored hitherto in the Irish and English schools of midwifery, it was regarded in other schools as one of the greatest usefulness, and by some as an improvement in midwifery only second in importance to the forceps. In that communication I detailed some cases in which I had used the cephalotribe, gave extracts from some of the leading authorities who had written on the subject, and stated in the form of distinct propositions the reasons that induced me to prefer the cephalotribe to crotchets, hooks, and craniotomy forceps in all cases of embryotomy. The paper was published in the Proceedings of the Obstetrical Society, at page 224 of the last number of this Journal; and as I have now had an opportunity of using the instrument in two other cases of extreme narrowing of the antero-posterior diameter of the pelvis which further proved the correctness of the assertion made, viz., "that the use of the cephalotribe reduces the dangers of embryotomy to a minimum, and allows of its performance in cases where it would not otherwise be possible," I think it my duty to record the particulars, as I believe a correct estimate of the powers of the instrument will enable us at least to save women from undergoing the risks of the Cesarean section to give birth to children already dead.

On Friday, 25th January, a woman was brought into the Coombe Lying-in Hospital, from a country district, in labour of her first child; my colleague, Dr. Ringland, saw her soon after her arrival. He found the body and limbs of a 7½ months putrid male fetus expelled from the vagina, the head of the child being still within the uterus, and above the brim of the pelvis. On examination, he found the neck had been torn through close to the base of the skull, in the efforts that had been made to extract the head; all the tissues, even the ligaments connecting the vertebral column with the skull, had given way under the force used, and a portion of skin, about an inch in breadth, at the back of the neck was the only connecting medium between the head and the body of the child. Dr. Ringland tried to apply the forceps, but could only get one blade of this instrument introduced, as the curved point of the second caught so in the torn tissues of the neck as to prevent its introduction without the risk of completely severing the connexion between the head and body. He now passed a hook into the mouth, and fixed it on the lower jaw, and tried in this way to extract the head; but the bone gave way, and he did not think it prudent to persevere, deeming the case more suitable for the cephalotribe. I arrived at the hospital at this period, and Dr. Ringland kindly complied with my request to be allowed to use the cephalotribe; so we put the woman under the influence of chloroform, and I proceeded to introduce this intrument, taking care not to complete the detachment of the head.

The promontory of the sacrum projected so much that though I got my hand well into the cavity of the pelvis I could not pass more than two fingers through the brim to guide the point of the blades. The os had closed in some degree below the head, and it was difficult to keep clear of the torn and ragged structures remaining where the neck had been torn away from the base of the skull, and, at the same time, to avoid the lips of the os uteri. By proceeding slowly and cautiously, however, I succeeded in introducing the blades in the transverse diameter of the brim and in seizing the head, which I at once compressed, causing the brain to break down, and pass out through the *foramen magnum.* I now turned the head, so as to bring its compressed and shortened diameter to the narrowest part of the pelvis, and attempted, with a moderate amount of force, to extract, but found the resistance still too great; so I loosened the blades, and applied them again, in a new direction, getting Dr. Ringland to steady the head by placing his hand over

the pubes, while I did so; and proceeding in this way, I made four crushings of the head, and then extracted it with the greatest ease.

I confess I had but little expectation of this woman's recovery. The amount of violence to which she had been subjected, and which had torn the body from the head, must have been very great. She had, moreover, been driven several miles on an uncovered vehicle in very harsh weather, coming to the hospital, and in consequence had a severe attack of capillary bronchitis; but she made a perfect recovery, and left the hospital at the end of three weeks. For some days after delivery there was great swelling of the vagina and labia, and incontinence of urine. The abdomen was tender, and the uterus large, but these symptoms soon disappeared, and recovery was only retarded by the condition of the lungs.

When convalescence was sufficiently established, we made a very careful exploration of the pelvis. We found that its antero-posterior diameter was little more than one inch and three quarters in length. When two fingers were introduced, so that the point of the middle finger touched the promontory of the sacrum, the side of the index finger was in contact, at its first joint, with the symphisis pubis. The transverse diameter was elongated. When examined externally the sacrum was found to be greatly curved and projected forwards. This deformity was, doubtless, due to rickets, of which the skeleton presented other evidence; but we expected rather to have found an exostosis as the cause of the narrowing, for the bones of both upper and lower extremities presented most remarkable examples of these growths. At the right knee there was one on the inner condyle of the femur, and one on the inner side of the head of the tibia, which appeared to form a single mass, and projected inwards, at right angles to the axis of the bones fully three inches; but as the free movements of the limb were not interfered with, there must have been a line of separation between them corresponding to the joint.

Had this woman presented herself at the hospital at the commencement of labour, with a living child, the question of Cesarean section would necessarily have arisen; but with a dead and mutilated child, the body of which was already born, there was no alternative but to extract the head by whatever means we could.

In a most instructive case, recently recorded by Dr. Greenhalgh (*Trans. of the Obst. Soc. of London*, Vol. VII., p. 220), this question arose, and the result of that case might have led us to determine on the adoption of the Cesarean section. It was the

patient's second pregnancy.   Labour now set in at the end of the eighth month, the previous delivery having been effected, by the crotchet, with extreme difficulty.   It was found that a foot presented; and as the woman had already given birth to a child, it was determined to attempt delivery *per vias naturales*, though the outlet and cavity of the pelvis were below the average dimensions, and there was little, if any, more space than an inch and three-quarters in any part of the antero-posterior diameter of the brim.   The feet were drawn down ; then the breech and arms, and traction made on the body, and the perforator introduced, but with little effect, in reducing the size of the head. Simpson's cephalotribe was now applied, and the head compressed, and while extractive efforts were made with it, an assistant pulled firmly and steadily on the body.   After the most persevering endeavours for about twenty minutes, the body unfortunately separated from the head, and at the same time the cephalotribe slipped.   The patient now became alarmingly collapsed, but rallied in about ten minutes, when an attempt to introduce the hand into the uterus failed, and the Cesarean section was performed.   The patient died thirty-one hours after the operation.

The close resemblance in many particulars between this case and the one I have detailed is very remarkable, and as I have said the knowledge of it might have led us to perform the Cesarean section at once had the other circumstances of our case permitted ; especially as Scanzoni who is a warm advocate of the cephalotribe, says the use of it should not be attempted even with an immature fetus if the shortest diameter of the pelvis be less than O.M. ·055 (2·16 English inches).   But Pajot's having succeeded by the system of repeated crushings without tractions in safely delivering a woman whose pelvis did not measure more than five centimètres, or 1·9 English inches, and the experience I have now acquired of this system of repeated crushings without traction, both in the case I have detailed, and in experiments on the heads of dead children convince me that cephalotripsy may legitimately be tried in all suitable cases in which the instrument can be passed through the brim of the pelvis.

In the next case, the narrowing of the pelvis was not to the same extent as the antero-posterior diameter was nearly three inches, but the child was full grown, and had not undergone putrefaction, so that the difficulty of delivery was still very great.

A woman was admitted into the hospital on Friday, 19th April,

in labour of her first child.   The membranes had broken on the
previous Tuesday, but the os had scarcely begun to dilate when she
applied for admission.   She had suffered from vomiting and retching
since the waters escaped ; and when she came into the hospital the
vomiting was incessant and very distressing.   At one o'clock, p.m.,
on Saturday, Dr. Ringland and I saw her together, when we found
the head completely above the brim, the os nearly fully dilated, but
its anterior lip hard, rigid, and caught between the head and the
pubes.   The promontory of the sacrum was projected very much
forwards.   There was a large scalp tumour which prevented our
ascertaining the exact position of the head, but we believed it to be
in the fourth of Nægélè.   The uterine contractions were good, but
no advance whatever was made under their influence.   The uterus
was moulded round the child, and there was an offensive thick, olive
discharge.   The mother's pulse was quiet, and the action of the
fetal heart strong and regular.   The vomiting and olive discharge
made us anxious to effect delivery, and we debated as to whether
we should turn or apply the forceps, but were deterred from
attempting version by the manner in which the uterus was con-
tracted on the body in consequence of the early escape of the
waters; so I applied the forceps, and made as vigorous extractive
efforts as we deemed prudent, having first tried to turn the head
into the first position; but we could neither advance the head nor
turn it ; so we withdrew the instrument, and determined to wait some
hours, to let the head get moulded to the passage, if possible, by the
uterine contractions.   At four o'clock we again saw her, but found no
change.   At eight o'clock we met again, and made another unsuc-
cessful attempt with the forceps ; and as the pulse was still quiet,
we agreed to wait till eleven.   At that hour Dr. Sawyer joined us
in consultation.   The pulse had now begun to rise, the uterine
contractions were becoming unfrequent and irregular ; there was
some tenderness of the abdomen, the vomiting continued, hiccough
had set in, and there was a dry, brown streak on the centre of the
tongue.   We believed these symptoms demanded immediate deli-
very—by craniotomy—and my colleagues readily consented to allow
me to use the cephalotribe.

I first perforated in the ordinary way, and then applied the
cephalotribe, and compressed the head ; but, as I found there was
still great resistance to its passing through the brim, I loosened the
blades and reapplied them three times, crushing the head each
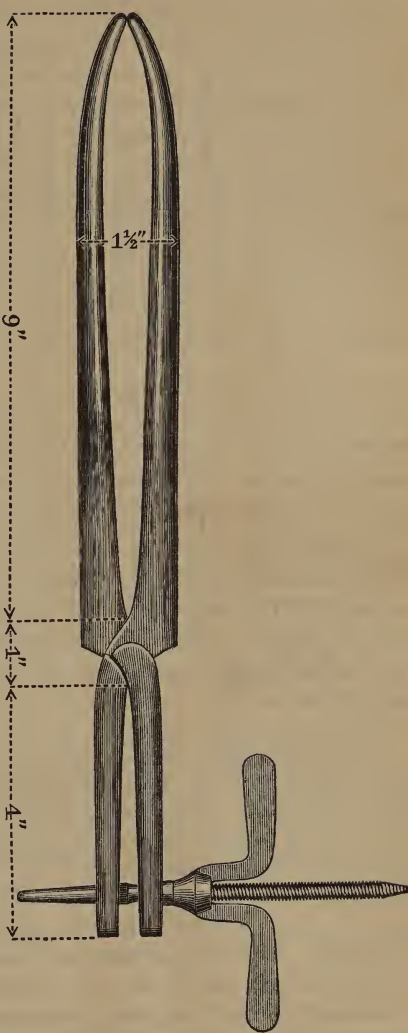time, when a very moderate amount of force was sufficient to

extract it, and the operation was completed with a degree of ease
and safety that afforded the greatest satisfaction both to myself and
my colleagues.   The mother's convalescence was uninterrupted.

In the paper read at the Obstetrical Society, I suggested certain
modifications in the form of Sir James Simpson's cephalotribe, and
stated that Messrs. Fannin of this city had made the instrument in
accordance with my recommendations.   In the annexed drawings
different views of this are given.
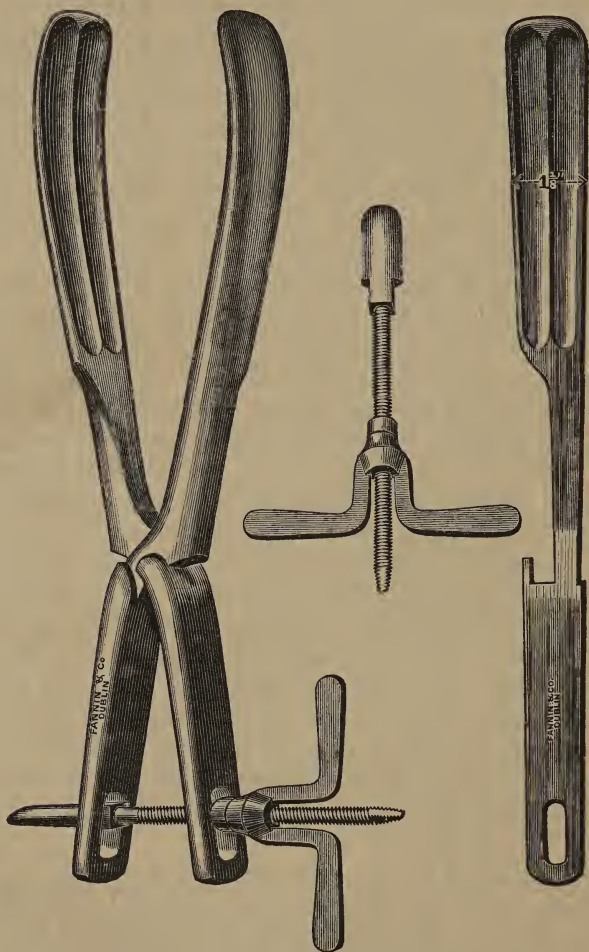
The measurements are contrasted in the table, which I reproduce
from my former paper, with those of Sir James Simpson's and some

other instruments. The whole
length is the same as Sir James
Simpson's, but the handles are
half an inch shorter and the
blades half an inch longer, that
they may more surely include
the base of the skull within
their grasp. During the ope-
ration in the last case I have
mentioned, it appeared to Drs.
Ringland and Sawyer, and to
myself, that it would be better
to have the blades made still
longer, or rather the shanks of
them; for, in the case referred
to, the head was so completely
above the brim, and the pelvis
so deep, that when the blades
were applied the lock was quite
within the vulva, and there was
considerable difficulty in pre-
venting the soft parts from
being nipped by the lock. I
have therefore advised Messrs.
Fannin to add fully an inch to
the length of the shanks, so as
to throw the lock outside the
vulva. The blades have no
pelvic curve, and when closed
they measure, from the outside
of one blade to the outside of
the other, only one inch and a
half, and each blade is one and
an eighth inch broad. The inner surface of each blade is grooved,
as in Scanzoni's and Simpson's, that it may hold firmly the part
to which it is applied; and the point of each blade is blunt and
round, to facilitate its introduction without injuring the uterus.
The lock is made the reverse way to that of Simpson's and all
others, and is made so that the groove in the upper blade locks
forwards instead of backwards when the instrument has been
introduced. In my previous paper I have already dwelt on this

Measurements of Cephalotribes.

	Weight	Entire Length	Blades				Pelvic curve [b]	Handles		Power
			Length	Breadth	Thickness	Breadth Closed [a]		Length of Handles	Length of Joint	
	lbs. oz.	In.	In.	In.	In.	In.	In.	In.	In.	
Baudelocque,	4 12	20·5	10·5	1·25	0·25	1·75	3·75	9	—	Winch and screw
Hodge, .	3 12	19·5	Shank 6·41 × 3·25, 9·83	1·41	—	1·5 Curve for Head	3	9·5	—	Screw and fly-nut.
Scanzoni, .	—	18·66	10·15	0·98	0·27	2·04	3·81	8·54	—	Screw and lever, with travelling bar.
Braun, .	2 0	16	8	0·91	0·16	2·16	2	6·5	1·5	Screw and joint in handle.
Simpson, .	2 4	14	8 5	1·12	0·25	2	2·37	4·5	1	Screw and fly-nut.
Hicks, .	2 6	15	9·25	1·12	0·25	1·5	3	4·5	1·25	Screw and two movable nuts.
Kidd, .	2 4	14	9	1·12	0·25	1·5	0	4	1	Screw and fly-nut.

point, and stated my opinion that all midwifery instruments should be made in the same way. Since that paper was published I have learned that Dr. Radford, of Manchester, made the same suggestion in his Essays, published in 1832, as shown in the following extract:—

" It is the custom in this country to place the parturient female on the right hand side of the bed, and reclining on her left side; so that the respective blades of the long forceps are called the upper and lower blade. Most writers speak of the great difficulty experienced in passing the upper blade, in consequence of the bed or mattrass below preventing that depression of the handle of the instrument which is necessary to raise the point so that it can be carried over the head to its ultimate destination. According to the usual construction of the lock of the English forceps, the lower must first be introduced, and however well placed the woman at first has been, during this part of the operation her position is changed; she recedes from the operator further upon the bed, and thus is caused difficulty in passing the second or upper blade.

" Several contrivances have been made to enable the practitioner to

[a] Breadth of blades closed is measured across the blades when locked and closed, and includes the thickness of the blades except in Scanzoni's.

[b] The pelvic curve is measured by placing the instrument on a horizontal plane and measuring the length of a line falling perpendicularly from the highest point of the blade to that plane. The measurement of Hodge's and Scanzoni's are taken from their books. The others from the instruments themselves.

pass the upper blade with more ease ; such as having a movable hinge in the handle (*Dr. Hamilton's and Dr. Davis' forceps*), or by means of a screw, through which the handle is fastened to the shank (*Dr. Conquest's forceps*).   The fears of the woman are usually awakened during the introduction of the first blade, and the anticipation of some dreadful operation leads her to recede from the accoucheur, placing herself in a most unfavourable position, perhaps on the opposite side of the bed ; he cannot, therefore, proceed in his operation until she is again placed in the original position.   In order, then, to meet this difficulty, the lock of my long forceps is reversed, so that the upper blade may be passed first, and then there will be no difficulty in introducing the second or under blade."—*Essays on Various Subjects connected with Midwifery*, page 14.

When the head lies low down in the pelvis the form of the lock is not of much consequence, but when it is at or above the brim, the form of lock now recommended will be found to facilitate the introduction of the instrument very much.   By reason of it the upper blade may always be introduced first, and carried into its proper position, and allowed to remain there, and the second or under blade may be introduced in front of the first, and in the same manner as the first—viz., first in the axis of the outlet, then in that of the cavity, and finally in that of the brim, as is so well described and figured by Dr. Beatty ; and once introduced it can be carried into apposition with the first blade, and locked without the first being disturbed or displaced.   It is one of the " curiosities of literature" that in the figure given by Dr. Churchill of Dr. Radford's forceps—Fig. 76 (Churchill's *Midwifery*, fourth edition)—the lock is represented in exactly the opposite position to that described by Dr. Radford, while in Figs. 74 and 75 of other forceps the locks are represented as described by Dr. Radford, but the circumstance is quite unnoticed in the text.

The screw is the same as in Sir James Simpson's : its head is oblong and the shoulder is squared, so that it can be fixed in its place or removed without the loss of time involved in completely unscrewing the nut ; and when fixed it forms a firm and very convenient cross handle to the instrument.

In conclusion, I have to remark on two objections that have been raised to the instrument in addition to those considered in my previous paper :   First—It is said that any case that would permit of the introduction of such a bulky instrument between the head and the pelvis, would be easily delivered by other means.   This is founded on a misconception as to the use of the cephalotribe.   The

cases suitable for the use of it are those where the head cannot enter the brim, and there is consequently no difficulty in pushing it aside to introduce the instrument, or those in which the head has been caught in the brim or cavity, and where room must first be made for the instrument by the perforator, and by pushing the head back from its position.

Second—It is said a craniotomy forceps will do all that is required of the cephalotribe, but the craniotomy forceps will scarcely diminish the size of the base of the skull; it leaves spiculæ to tear the mother and the hands of the operator, and it affords no means of making extractive force.

Finally, I repeat my assertion that the cephalotribe is to be preferred to all other means of performing embryotomy, the dangers of which it reduces to a minimum, and the performance of which it permits in cases where this would otherwise be impossible; and to this I would add that the true use of the instrument is to lessen the size of the head, for which the crushings must be repeated as often as may be necessary to enable it to pass through the pelvis, with ease, and without forcible traction.

P. S.—It probably accords with the experience of most hospitals that peculiar cases occur in groups. At the Coombe we seem at present to be going through a series of cases presenting very narrow pelves, and so it happens that since the foregoing was written I have had an opportunity of seeing a very complicated and difficult labour case under the management of my colleagues Drs. Sawyer and Ringland, the particulars of which will, I trust, be published, in which, after several ineffectual efforts with the crotchet, delivery was completed by the cephalotribe, in a manner that afforded further proof of the great value of this instrument.

Art. XX.—*A Case of Dilatation of the Abdominal Aorta with Atheromatous and Bony Deposits in the Coats.* By Thomas Darby, F.R.C.S.I., L.K. and Q.C.P., &c.; Med. Officer to Rathdown Workhouse and Fever Hospital.

The accompanying woodcut represents a diseased condition of the abdominal aorta of a gentleman who died in January last.

Mr. S. M., a tall, spare, athletic man, about fifty-five years of age, of very active and strictly temperate habits, consulted me on

29th October, 1865. On my arrival at his house, I found him walking about with a stooped, listless gait; he looked pale, and his

countenance was expressive of anxiety; he told me, in effect, that in the month of June previous, he had recived a severe wrench in his back, and had constant though not very severe pain in the left side of his spine, somewhere about the " short rib," ever since; for the last three weeks his stomach had been irritable, he frequently vomited his food, and felt he was growing weaker; he had been under medical treatment, but derived no benefit; he suffered occasionally from hemorrhoids, and had varicose veins in his legs; his bowels were regular, and the renal secretion normal.

Having placed him in the recumbent position on his back, with his head and knees slightly raised, I proceeded to examine him.

his skin was cool, respiration easy, pulse 100, tongue clean and healthy looking; I could not observe any unnatural fulness or tumour in the abdomen, but perceived a very strong pulsation in the epigastrium, where slight pressure induced nausea: on applying the stethoscope to the left of the epigastrium, a loud, rough, bellows murmur was distinctly audible, which I heard in a minor degree as I proceeded downwards to both common iliac arteries where it was lost. I could not hear any murmur in the course of the thoracic aorta; both sounds of the heart were particularly distinct and well defined; when he stood upright the abdominal pulsation greatly diminished, and no murmur could be heard; on examining his spine with the fingers, no tender spot was discovered; but on drawing a warm sponge from the nape downwards, he complained of feeling a hot, uncomfortable sensation as it passed over the ninth and tenth dorsal vertebræ. This was his condition at my first visit.

I visited him at intervals; palliative treatment relieved the irritability of stomach, and he was, after a short time, able to retain a reasonable amount of light nourishment. An enlargement of the left lobe of his liver became manifest, and in the month of May following, it could be easily traced an inch below the margin of the ribs. He grew gradually weaker, and died quietly, apparently from exhaustion, on 22nd January, 1867. A *post mortem* examination, forty-eight hours after death, revealed a cavity[a] in the top of the right lung: the thoracic aorta and the heart appeared healthy: the left lobe of the liver, enlarged and soft, contained two or three masses of tubercular deposit on its under surface. It was attached by old adhesions to the great end of the stomach; two lymphatic glands, each somewhat larger than a pigeon's egg, one on either side of the dilatation of the aorta, as shown in the wood-cut, were found firmly bound to it by condensed cellular tissue. The aorta, when slit open, presented a rough flocculent appearance on its inner surface: two pits or small dilatations, each containing coagulated blood, occurred immediately below the point where the artery emerged through the diaphragm; copious deposits of atheroma and bony plates were found between the inner and middle coats extending into the iliac arteries, the left of which was completely plugged up by a clot of coagulated blood; no abrasion or other morbid condition was observed in the bodies of the vertebræ.

[a] Mr. M. never complained to me of having a cough or expectoration; and his family have assured me that they never knew him to have had a cough until three or four days before his death.

The history, symptoms, and physical signs I have detailed, led me to pronounce the case one of abdominal aneurism: Dr. Stokes, who saw Mr. M. in consultation with me on the 2nd of November (four days after my first visit and fourteen months before his—Mr. M.'s death), taking into account the cachectic condition of the patient, and being unable to discover any tumour, expressed himself doubtful as to the precise nature of the case, but inclined to the opinion that no aneurism existed; and at the time he was probably right; but, that the dilatations containing coagula were incipient aneurism, I believe there can be no doubt.   Whether the enlarged glands may not have given support to the weak point in the vessel, and thereby arrested the further development of the aneurism, or the plug found in the left iliac artery was the result of embolism or merely a *post mortem* clot, I am unable to decide; but the case altogether presents so many features of interest, I am induced to make it public.

Art. XXI.—*Report on Cholera, with Remarks.* By Drs. Hayden and Cruise.

MATER MISERICORDIÆ HOSPITAL.

In the subjoined report we propose to give the details of 197 cases of cholera, admitted into the Mater Misericordiæ Hospital, and treated by us, or under our immediate direction, between the 17th August and the 17th December, 1866.

By previous arrangement, all the cases admitted between twelve o'clock at night and twelve noon of the following day were placed under the care of Dr. Hayden, and those admitted between the hours of twelve noon and twelve at night were placed in charge of Dr. Cruise.   Dr. Hayden was supposed to visit the hospital in the morning or midday, and Dr. Cruise late in the afternoon; but all interesting, anomalous, and difficult cases were seen by both of us in consultation.   The resident pupils, Messrs. Michael O'Hanlon and George P. Ryan, assisted by Messrs. Coyne and Finnegan, and subsequently Messrs. Conolly and M'Kenna, were in constant attendance, day and night, upon the patients, performing with their own hands the necessary operations, such as administering enemata, registering variations of animal temperature, giving inhalations,

hand-rubbing the limbs, and often lifting the patients into and out of bed. These gentlemen likewise performed a large part of the duty of reporting the cases, under our supervision; and to their intelligence and zeal in carrying out our instructions, and acting in emergencies in our absence, are in a great measure due the favourable issue of several cases, as well as the fulness and accuracy of this report.

To the Sisters on duty in the cholera wards we beg to express our deep sense of obligation, not only for the scrupulous accuracy with which they carried out the details of treatment, but likewise for the valuable assistance which they afforded us in collecting materials for the history of several cases; and to their courage, self-devotion, and unremitting attention to the patients, and the wholesome moral effect wrought by their example in the minds of both patients and attendants, we have much pleasure in bearing our united testimony on this, the first suitable occasion presented to us.

We have classified the cases of cholera under two heads—namely, *choleraic diarrhea*, characterized by purging, vomiting, cramps, and prostration, or at least by two of these symptoms conjoined; and *algid cholera*, marked by two or more of the preceding symptoms, either past or present, *plus* failure of the circulation, depression of temperature, and, in the great majority of cases, lividity of surface; loaded and peculiar tongue; urgent thirst; sunken features; shrivelling of the finger ends; and impairment or loss of voice. These constituted the essential symptoms, and in several instances served to indicate the disease, in the absence of any peculiarity of respiration, suppression of urine, restlessness, or thoracic oppression; all of which, though present at some period in most of the cases, were, nevertheless, so frequently absent that we are forced to regard them as accessory, rather than as essential phenomena.

To each of these symptoms, and others which, being of rare occurrence, must be separately classed as *epiphenomena*, special attention will be directed in the sequel.

In drawing up a report on cholera, or any other epidemic disease, the objects which the physician should propose to himself, as it seems to us are twofold:—Firstly, by a careful classification and analysis of his cases, to educe from them, in the aggregate, definite information in reference to certain questions of a general character, such as the typical features by which the disease may be identified; the exceptional characters it may present; the order in

which the symptoms are usually manifested, and their relative gravity; the mode of communication of the disease; the predisposing and determining causes of the attack; the influence of age, sex, previous health, and habits of the patients, upon the issue of the cases, and the relative value of different medicinal agents and plans of treatment. And, secondly, to offer such opinions upon unsettled questions in relation to the disease under investigation as his *data*, carefully considered and rigidly scrutinized, may seem to him to warrant.

It is obvious that the conclusions arrived at, under these two heads, must possess very different value. The former, being the result of simple calculation, must be admitted, assuming the record and tabulation to be correct, whereas the latter, being matter of opinion, may be questioned, and can carry conviction to the minds of others only in proportion to the weight of evidence on which they are based.

Under these two heads we propose to offer the result of our experience during the late epidemic of cholera in Dublin. We would add that, in view of the possible, and by no means improbable, reappearance of cholera amongst us in the course of the present year, but certainly at no very remote period, it is, in our opinion, the duty of every physician who, with sufficient opportunity for observing and treating that disease, has made it the subject of anxious study, to publish the result of his experience, in the hope that, by a multiplication of carefully compiled statistics and closely observed facts, our acquaintance with the disease in all its bearings and details may become so intimate, that the precise nature of the morbific agent which produces it, and the means by which this agent may be counteracted and neutralized, can no longer elude detection.

It is not true to assert, as is the fashion, that we are ignorant of cholera. Its differential diagnosis has been clearly established; its habitual routes traced and mapped out; the conditions favourable, if not essential to its diffusion are recognized; its prodromata and stages identified and distinguished, and the relative gravity of its symptoms duly estimated; the media of its conduction have been all but universally admitted, and its morbid anatomy made a part of our settled medical literature. In short, our knowledge of the natural history and pathology of cholera may be pronounced as definite and complete as that of any other of the great zymotic class. But, now, let us inquire in what that knowledge is defective?

In relation only to the precise nature of the morbid poison of cholera, and an absolutely successful plan of treatment, can this be said to be the case.

Various attempts have been recently made to isolate the morbific germs of those diseases which admittedly owe their origin to a toxic agent entering the circulation through the medium of the atmosphere; as, for example, scarlatina, measles, typhus fever, and influenza; but in no instance hitherto have these attempts been successful, and at the present time our knowlege of these diseases is, in this respect, quite as incomplete as it is in regard to cholera.

It is not just, therefore, to assert that our knowledge of cholera, in regard to proximate causation, is in a more backward state than it is in regard to the diseases just mentioned.

But, are we to abandon the inquiry into the mysterious agency by which cholera is produced, as one in which success is not attainable? By no means; we should rather hope that through the zealous co-operation of the great number of accomplished and enthusiastic investigators at present engaged in this field of inquiry, prospectively so fruitful in great results, the precise nature and properties of the cholera-poison will be ultimately made out. Till then, and pending the active prosecution of this inquiry, it is our duty to take advantage, to the fullest extent, of the knowledge we actually possess in the prevention and treatment of the disease. It seems to us that already a considerable advance has been made in this direction, chiefly by the method of exclusion, as exemplified in the valuable researces of the Rev. Dr. Haughton, recently laid before the Medical Society of the College of Physicians; and we doubt not that when, by a further application of this method, the alleged causes of cholera shall have been, one by one, examined and set aside, the minds of physicists and chemists shall be so forcibly concentrated upon the few remaining possible causes, that success will become as it were a necessity. Here we would observe that a mere *quality* of the atmosphere, such as an excess or deficiency of ozone, irrespectively of specific contamination, will not account for the origin and spread of cholera. The doctrine of contagion, if well established in relation to cholera, as we believe it has been by our experience of the recent epidemic, will of itself suffice to exclude this hypothesis; for, in the instance of a personal importation of the disease into an uninfected locality, it is impossible to conceive a contemporaneous importation of a special atmosphere, and without the atmosphere its *qualities* could not have been imported.

But, if it be conceded that in the locality whence infection was derived there existed in the atmosphere, by previous importation and reproduction, the specific poison-germs or elements of cholera, of whatever kind, then it will not be difficult to conceive an *adherence* of these to the dress and person of the infecting party, and a communication of them to the infected.

Much confusion has arisen in the literature of cholera from the non-observance by writers of a precise distinction between primary and secondary causes; thus telluric influences are often mentioned as acting directly and immediately on the human body, whereas, manifestly, all telluric emanations operate through the medium of the atmosphere.

The treatment of cholera, though unsatisfactory in its main results, is rendered so chiefly by two causes—namely, the neglect of premonitory symptoms, and the difficulty of bringing about reaction in the stage of collapse, owing to the state of all but complete abeyance of the vital functions which is involved in this stage.

As already stated, we propose to divide cholera into two stages—those, namely, of *choleraic diarrhea*, and of *algid cholera*, or collapse. But in a large percentage of cases, as will appear in the sequel, these stages are preceded by diarrhea, well named "premonitory," and characterised by watery and painless evacuations, associated with debility, languor, flatulence, thirst, and repugnance to solid food, and feelings of muscular soreness rather than of pain, especially in the calves of the legs. After a period varying from a few hours to as many weeks, the symptoms which constitute the stage of choleraic diarrhea are superadded—namely, the alvine evacuations become more frequent, and assume a thin gruel, or rice-water character. There is vomiting, muscular spasm of the abdomen and extremities, a character of tongue which is *sui generis*, and eminently distinctive of cholera; it is moist, comparatively cold, loaded with yellow creamy fur in the centre, and clean along the edge over a belt of about one-eighth of an inch in width. Thirst is now urgent, and the fluids taken are promptly rejected by the stomach. The pulse is weak, but not quick; the features are somewhat shrunken, and expressive of anxiety, and in many cases the pupils are dilated; the conjunctivæ are usually injected: the surface, in most cases, is dry, chilled, and pallid, but in a few it is suffused and bathed in perspiration. With regard to the order in which these symptoms occur, we have remarked that when preliminary diarrhea has existed, vomiting has been only second in the order of occurrence—that is, in all such

cases it has been preceded by aggravated purging. But in those cases in which the stage of choleraic diarrhea has been at once ushered in, unpreceded by laxity of bowels, or in which the attack has been provoked by excess or indiscretion in diet or drink, vomiting, in all such cases, has taken precedence. In a very small proportion of cases only have cramps been the first symptom exhibited. Collapse now rapidly supervenes; it is at first characterised by the symptoms of the preceding stage, modified only by failure of the circulation. The body exhales a peculiar nauseating odour; it is cold and moist, and to the touch feels like that of a frog; the features are shrunken and livid; the eyeballs sunken; the conjunctivæ injected with purple blood, and smeared with viscid mucus; the pupils are in some cases dilated, and in others contracted to the size of pin-holes; the breath and tongue cold, and the latter moist and coated as already described; the voice is hoarse and whispering, or entirely suppressed; the ends of the fingers and toes are shrivelled, and the nails of a purple colour; the bowels are evacuated involuntarily, the *dejecta* being of a gum or rice-water character, usually containing small white flocculi, and occasionally presenting a faintly pinkish tint. The contents of the stomach are ejected frequently, and with remarkable suddenness and force, often to a considerable distance from the patient's bed; they consist of the fluids taken, intermixed with blood-serum, and often with bile. The patient in this stage is remarkably restless, flinging the limbs about in the most disorderly manner, rolling from side to side, and sometimes actually tumbling out of bed. There is usually complaint of dull aching pain in the loins, associated most commonly with suppression of urine; likewise, of a burning heat in the epigastrium. The expression of suffering is usually subdued, but occasionally the moaning of the patient is loud and distressing to hear. Cramps are, from time to time, suddenly developed in the lower extremities, abdomen, forearms, and hands, causing incurvation of the toes, and rigid straightening of the fingers, and eliciting from the patient loud cries of anguish; they cease usually a few hours before death. The respiration varies in different cases; most frequently it is natural, but in many cases, especially those that exhibit great restlessness, and in which the patients complain of oppression of the chest, the breathing is slow and embarrassed, and in some cases irregular. In a few cases it has been found quickened shortly before death, without a corresponding increase in the rate of the circulation. The pulse ranges, most frequently, from 80 to 90 in

the minute, is small and thready, and soon becomes imperceptible; it is occasionally irregular and intermittent, and this character may be regarded as of exceedingly bad omen. In the early period of collapse the heart's sounds are weak, but distinctly audible; usually, after a short interval, the second sound is suppressed in the aorta, but continues to be audible in the pulmonary artery to a somewhat later period; it next ceases to be heard here, and now the first sound, which had been gradually losing power, is likewise extinguished. Nevertheless, life may continue for an hour, or even longer, in this state.

In a few cases we have noted intermittence of the heart and radial pulse in the advanced period of collapse; and in one of these recovery took place under treatment with large doses of quinine. We have likewise observed in a few cases of collapse that the temperature of the rectum was slightly in excess of that of the axilla; these cases, and the observations made upon them, will be detailed further on in this report. The intellectual faculties usually continue unimpaired to the end, but in a few cases coma has supervened; delirium very rarely occurs.

We hope we may be excused for occupying so much space with a description of the typical and exceptional features of cholera in its several stages, already so well known to the profession. We deem it right, however, to place upon record the aspects and variations of the disease as presented to us during the recent epidemic, for the purpose of comparison in a future visitation. With regard to the suppression of the second sound of the heart in cholera, we are not aware that it has been previously observed.[a]

A question of much interest has been debated in connexion with the premonitory diarrhea—namely, whether it should be regarded as being of a specific character, closely allied to cholera, and, in fact, constituting its first stage. We feel obliged, by the evidence before us, to answer this question affirmatively, and to declare our opinion that the premonitory dirrrhea, so called, is, when present, the first manifestation of cholera.

[a] It afforded us much pleasure to hear Dr. Henry Kennedy stating in the recent debate on cholera, at the College of Physicians, that he had made an observation similar to our own, with regard to the suppression of the second cardiac sound in the collapse of cholera. Doctor Kennedy's observation was strictly independent of ours, as reported in our abstract read before the College in the preceding week, and therefore the more valuable as confirmatory evidence. His observation refers to the second sound *generally;* we should be glad to know whether he has observed the difference which we have mentioned, between the period of suppression of the second sound in the aorta and in the pulmonary artery.

The well-known prevalence of diarrhea, preceding and during an epidemic of cholera, has been often, and we think with good reason, adduced as evidence of an "epidemic constitution" of the atmosphere, influencing the affected locality, and playing an important part in the causation of cholera. Conversely, it may be assumed that the diarrhea which is associated with this "epidemic constitution" is choleraic in its origin and character. The objection that this diarrhea, if early attended to, is amenable to ordinary astringent treatment, is of little weight, and demands a two-fold answer—viz., Firstly. The premonitory diarrhea of cholera is *not* amenable to the treatment successfully employed in ordinary diarrhea; it requires a stimulant, and in some degree, a peculiar treatment. Chalk mixture with opium, catechu, &c., which promptly arrests simple diarrhea, has not, usually, an equal measure of success in that which precedes cholera, whilst sulphuric acid is all but invariably effectual in checking it. 2ndly. The successful treatment by astringents, of diarrhea, regarded as an early symptom of cholera, only shows that the treatment of symptoms, in the absence of a better indication, should not be disregarded. A symptom is but the reflection of a morbid cause in active operation in a particular part or element of the body, and to arrest the process by which the symptom is produced, is, in effect, to suspend the activity of the cause, if not to neutralize it. Diarrhea is one of the earliest symptoms of cholera, and not the less choleraic because easily curable, and, as we believe, incommunicable in this stage. In all the alleged instances of importation of cholera by persons suffering at the time from diarrhea only, the infecting party has invariably passed into the more advanced stages of the disease before the infected have exhibited any of its recognized symptoms.

In a large percentage of cases, as will appear from one of the subjoined tables, diarrhea has preceded, often by several days, and in a few cases even by weeks, the manifestation of cholera in its typical form; and during an epidemic of cholera it is well known that diarrhea, if neglected, most frequently issues in an attack of that disease.

Dr. Sedgwick Sanders, in a report upon the recent epidemic of cholera presented to the Diseases Prevention Committee of the City of London Union,[a] states:—" That the experience of the medical officers employed in the Union has confirmed the conviction

[a] Medical Press and Circular, February 6, 1867.

that the early treatment of diarrhea cannot be too strongly insisted upon, as there is much reason to believe that this so-called *disease* is often an early *symptom* only, and must be looked upon as an essential premonition of the choleraic incidence, so that many cases treated successfully as diarrhea ought, nosologically, to be classed under the head of cholera cured in its early or premonitory stage. This admits of no more direct *proof* than any other negative proposition; but analogy and experience justify the assumption—hence the advantage of searching out such cases by daily house-to-house visitation, and in this manner enabling the medical practitioner (by dealing with the disease at its inception) to arrest its degeneration into the more severe and less tractable phases."

M. Borlée,[a] writing of the recent cholera epidemic at Liege, states that:—" During an epidemic we all experience, in greater or less degree, the influence of the choleraic poison." If by this statement it is meant to be conveyed that in an infected locality a large proportion of the inhabitants, reputedly in good health, experience malaise, characterized by nausea, partial loss of appetite, and flatulence, and an indescribable sensation in the abdomen of an unpleasant character, with slight muscular pains, we quite concur with M. Borlée, in the opinion that the coincidence indicates the presence of a noxious atmospheric influence operating upon the entire locality, and conveniently designated as an " epidemic constitution."

The idea conveyed by the words " epidemic constitution" involves one of the deepest mysteries in medicine. It implies a condition of body favourable to the operation of a subtle and impalpable agent diffused amongst the inhabitants of a limited district at particular times. What is the nature of this agent, and the medium of its conveyance? and what the precise condition of body that favours its attack? In reference to the two latter questions, opinion is now all but unanimous in regarding atmospheric air and water as the media through which the poison of cholera is introduced into the body, and a certain undefined state of depressed vitality as the condition of its effective operation. But although our knowledge is practically advanced by these *data*, and we are thereby enabled to dispute the approach, and even to preclude the attack of the choleraic agent, still we require to be informed as to the distinctive peculiarities of the choleraic atmosphere, of the water contaminated with the poison of cholera, and as to the precise

[a] Bulletin de L'Academie Royale de Médécine de Belgique, Année, 1866.

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condition of body that constitutes a receptivity of that poison. Mr. Paget declares :[a]—" That the existence of certain materials in the blood may determine the formation of structures in which they may be incorporated." It would seem, by a parity of reasoning, not unwarrantable to assume the existence of certain conditions of that fluid which may invite or determine the invasion of a morbific agent suspended in the atmosphere, or in the water made use of by a community.

Of the existence of a definite condition of the blood, as necessary to the reception and development of morbid poisons, examples are afforded in the immunity from syphilis, small-pox, scarlatina, and other diseases of this class, enjoyed by individuals at particular times. Thus, of a number of persons inoculated at the same time, with the vaccine virus obtained from one source, only a certain percentage will develop the disease, although at another time the persons who thus resist may be successfully vaccinated. Again, scarlatina or measles may invade a family of several children, of whom one or more may escape the disease, though exposed equally with those who contract it; at a subsequent period these persons, though exposed perhaps in a minor degree, may receive the poison they had previously resisted, and develope the disease even in an aggravated form. In all such cases, of which examples are numerous, the legitimate and necessary conclusion is, that in the first instance a state of receptivity, or blood-affinity for the poison did not exist; and that such inaptitude was of temporary duration, and coeval with the absence of those vital conditions that constitute a state of receptivity.

We attach no importance to the allegations made in reference to coloured mists and vapours said to have been witnessed in localities visited by cholera, because they rest upon unsatisfactory evidence; at the same time, we cannot admit the impossibility of such meteoric phenomena, holding as we do, that the atmosphere of a cholera-infected locality becomes, after a short time, charged with the poison of cholera extricated from the bodies of those stricken with that disease. The nature of this poison is as yet undetermined; but if it shall be found to be *organic*, as seems to be indicated by the evidence we possess, then the presence in the atmosphere of myriads of minute organisms would afford, on physical grounds, a satisfactory explanation of the optical phenomenon of coloured mists.

[a] Lectures on Surgical Pathology, Vol. i., page 27.

M. Chauveau, of Lyons, has recently proved experimentally that horses may be vaccinated by causing them to inhale the dried and pulverized matter of the vaccine vesicle; in these instances the resultant vesicles were formed, not on the bronchial, but on the cutaneous surface, thereby showing the predilection of the disease for its ordinary habitat, irrespectively of the mode of its communication. These experiments, moreover, prove conclusively the communicability of zymotic disease, in a palpable form, through the medium of the atmosphere.

In the capillaries of the atrophied intestinal villi of patients who had died of cholera, Dr. Beale[b] has discovered bacteria, and the sporules of fungi. We have, ourselves, found in the deposit upon the tongues of cholera patients vibriones in active motion, and chains of sporules. No doubt, the infusoria and sporules of fungi so found may have been the product of decomposition; but it is worthy of notice that in the deposit taken from the tongues of patients suffering from diseases, other than cholera, we have invariably failed to detect such products. The evidence before us, then, would seem to warrant the admission that cholera *may* have for its immediate cause minute living organisms, introduced as such into the body, or developed therein by a process of zymosis from a specific morbid ferment introduced by the lungs or alimentary canal.

There are two opinions held in regard to the origin and propagation of cholera ; one, that it is of telluric origin, the atmosphere and water serving as media of dispersion—of unknown quality or nature—having a special and peculiar affinity for the human body; and favoured, if not absolutely determined in its invasion of individuals and communities, by a lowered hygienic condition the result of errors or imperfections in the supply of air, food, water, or one or more of these.

The other, that it originates only in, and is peculiar to, the human body; that it is of the nature of a specific animal poison, organic or inorganic; that it is communicated by the infected to the uninfected, either directly, through the excretions or emanations of the former brought into contact with, and introduced into the bodies of the latter by immediate personal or fomitic intercourse, constituting *contagion ;* or indirectly through the air and water, constituting *infection ;* but in either case requiring a receptivity on the part of the infected as a necessary condition of attack.

[a] Medical Times and Gazette, February 23, 1867.
[b] Medical Times and Gazette, January 5, 1867.

Various modifications of these views are held, which it is unnecessary here to specify; indeed, many of the opinions put forward in relation to the natural history and pathology of cholera rest upon mere assertion. For ourselves, we do not pretend to say how, or from what precise source, cholera has taken its origin; this portion of its history, like that of other specific and contagious diseases, is absolutely unknown. That the history of cholera dates further back than the year 1817, when it is said to have first shown itself in the Delta of the Ganges, has been satisfactorily proved by Dr. Craigie,[a] who identified in the cholera of our own time a disease described under that name by Aretæus, who flourished before the reign of the Emperor Titus.

Dr. Graves,[b] quoting from Le Begue de Presle, says:—" In 1762 it (cholera) prevailed very extensively in Upper Hindostan, and destroyed thirty thousand negroes, and eight hundred Europeans." The same learned writer gives several extracts from other authors and travellers in India, which show conclusively that as early as the last quarter of the eighteenth century cholera was familiarly known in that country.

Of the precise nature of the poison of cholera scarcely more is known than of the date of origin of the disease. We have already given some evidence to show that the organic theory has most facts, rather, however, of an indicative than of a positive character, to support it. It is to be remarked, also, that this theory best accords with the indubitable adherence of the infecting principle of cholera to the dress and furniture of the infected; its rapid multiplication; gradual decline; and connexion with heat and moisture.

That it is not of a gaseous nature in a state of combination with the surrounding atmosphere, and independent of reinforcement from local sources, seems indicated by its indifference to strong winds, and by its property of self-multiplication, which is not characteristic of gases, or other inorganic bodies.

Thermometric variations seem only to supply conditions that favour or retard the progress of the epidemic, but never to give origin to the disease in the absence of its specific germs.

We believe that between separate localities and communities the vehicle of conduction for cholera is man himself, infected by the disease, and manifesting at the time its unequivocal symptoms; or his dress, bedding, or other articles in close relationship with his

[a] Edinburgh Med. Journal, Vol xxxix., page 332. Et sequent.
[b] Dublin Journal of Medicine, January, 1840, Page 359.

person whilst the subject of cholera. From this it follows that the rate of transit of the poison of cholera must be equal to that of man himself, and must vary with the rapidity of human intercourse.

We regard it as proven, and will give evidence to this effect in the sequel, that the atmosphere of a cholera-stricken locality may serve as the medium of contamination for short distances, as between the different apartments of the same house, or the adjacent streets of the same town. It would seem, however, that the atmosphere must have attained what may be called the saturation-point of choleraic impurity before it can serve in this manner. Cholera is, therefore, in this limited sense, *infectious*, and although direct importation by means of persons or *fomites* is necessary in the first instance, after the lapse of a certain period of time an " epidemic constitution " of the atmosphere is created in the locality by the multiplication of cholera germs; and now the disease may spread within limited areas by the atmosphere alone, and irrespectively of personal communication. Subsequently it would seem that the condition of depressed vitality, whether due to personal or local causes, will alone suffice to determine an attack amongst the residents of a district so circumstanced.

The sudden invasion by cholera of persons previously in good health, immediately, or within a few hours after taking food or drink to excess, or of an unwholesome character, but free from the suspicion of containing cholera-germs, may be likewise adduced as evidence of an epidemic constitution. Of such a mode of seizure several examples will be given in the subsequent part of this report. In these instances the connexion as of cause and effect was too striking, and the coincidence mentioned of too frequent occurrence, to admit of the supposition that previous contamination by personal contact or otherwise had taken place. Moreover, in all these cases, the premonitory diarrhea which usually marks the accession of cholera contracted by exposure to contagion, was absent, whilst the causes to which the attack was attributed are admittedly incapable of producing it in ordinary times.

The explanation of these cases seems to be, that the excess or indiscretion committed, not only created a receptivity by diminishing vital resistance, but actually invited and promoted invasion by ushering in two of the most prominent symptoms of the disease, namely, vomiting and purging.

The comparative want of success which has hitherto attended

the treatment of cholera most certainly applies only to the stage of collapse; the preliminary diarrhea is arrested, and cholera, as it were, aborted, by a few doses of dilute sulphuric acid conjoined with a regulated diet. Choleraic diarrhea, as will be shown, is likewise curable by the same treatment, with the addition of frictions, warmth, sinapisms, and a few other adjuvants. To this statement we have met with only four exceptions, which we beg to introduce here for the purpose of comparison, and because they serve to prove the general rule we have ventured to enunciate.

CASE I.—James Dowse, aged forty, of temperate habits, admitted into hospital October 20, at 9.30 a.m. The day previous to his admittance he had attended his wife's funeral, and subsequently drank to excess; on the evening of that day he was seized with vomiting and cramps. On the morning of the 20th, when admitted, he was suffering from vomiting, purging, and cramps in the legs; the surface was remarkably pallid, indeed blanched, justifying the designation of " white cholera;" the tongue was moist and coated, but not clean upon the edge as in all the other cases that came under our notice. Ten grains of calomel were given immediately; and at 11 a.m., as the intestines seemed distended with fluid, a draught was given containing ol. Ricin. ʒiv., Tinct. Rhei. ʒii., aquæ Menth. Pip. ʒi.—After this had acted calomel was again given in doses of gr. ii., every hour. Warm jars were applied to the feet and legs, and mustard cataplasms to the abdomen. The patient died in collapse at two o'clock on the morning of the 21st, twenty-eight and a half hours after seizure, and sixteen and a half hours after admission into hospital. Whilst under treatment, he took gr. xxxii of calomel.

In this case, at the period of invasion, there existed the unfavourable condition induced by depression of spirits and a debauch; and the treatment did not include sulphuric acid and opium.

CASE II.—A woman named Johanna Burke, aged about sixty was admitted labouring under " choleraic diarrhea," treated with chalk mixture and aromatics she got better of the diarrhea, but passed into a low febrile condition, in which she died.

CASE III.—Francis Clarke, aged thirty-eight, of very intemperate habits, was admitted to the hospital, October 18th, suffering from severe choleraic diarrhea, with vomiting and cramps. He

had been ill twelve hours previous to admission, but was quite warm, and showed no symptom of collapse. Despite of treatment by calomel, sulphuric acid, stimulants, external heat, &c., he ran on into collapse, and died, October 21st, having had severe convulsions before death.

Case IV.—A shopkeeper, resident in Dublin, called upon his medical attendant late in the evening of the 9th October, to request that he would visit one of his children who was slightly ill; this child was found to be labouring under cholera, and despite the skilful treatment applied, rapidly passed into collapse, and died. Before the medical gentleman left the house, another of the children was reported ill, and in defiance of the treatment promptly and assiduously employed, became collapsed and died.

A third member of this afflicted family, a boy aged about nine, complained of being slightly ill when the medical attendant was about leaving; he was put under appropriate treatment, but notwithstanding, upon a subsequent visit made within a few hours, he, too, was found in the stage of collapse, and died shortly afterwards. Thus, in this single house, three members of one family were seized with cholera, and carried off in the course of one night, in defiance of the the most skilful and assiduous treatment by a gentleman who has had large experience of the disease in former visitations. We have been informed by that gentleman that the nauseating odour which he experienced in that house, whilst in attendance upon these children, was of so overpowering a character that he felt great difficulty in restraining himself from vomiting, and succeeded only by taking some brandy on the instant. On the following morning, by the advice of the medical gentleman in attendance, the mother and the three remaining children were removed to an avenue in the suburbs; within a few hours of their removal, one of these children, a girl, aged about fourteen, was attacked with purging and vomiting, and at five o'clock on the evening of that day she was visited by Dr. Hayden, in consultation with the family physician. The patient was found swathed in flannel, and surrounded by hot jars. The surface was warm and perspiring; pulse quick and firm; there was purging, and occasional sickness of stomach; and cramps, not of a very urgent character, occurred at intervals. The patient was at once put upon the sulphuric acid and opium treatment; but, notwitstanding, collapse supervened within a few hours, and the patient died in the course of

that night.   In this case, therefore, we have an example of choleraic diarrhea of a typical character, resisting the treatment all but uniformly successful; but the history of this child's family, above detailed, justifies the conclusion that her hygienic condition was so depressed, and that she had received so large a dose of the poison of cholera, as to set all treatment at defiance.

We here beg to introduce the following tables, in which we think will be found the most important particulars respecting the disease as seen by us:—

TABLE 1,

Showing the number of cholera cases admitted into the Mater Misericordiæ Hospital each week during the epidemic of 1866, viz., from the 17th August to the 17th December, inclusive.   The average duration of illness, period in hospital, and result of these cases:—

Week ending	No. of cases	Average duration of illness, in hours		Average period in hospital, in hours		Result		Per centage mortality
						Died	Recovered	
		hours	minutes	hours	minutes			
August 21,	1	600	0	432	0	—	1	—
,, 28,	4	47	0	34	45	2	2	50·0
September 4,	13	109	13	75	41	3	10	23·0
,, 11,	18	66	9	42	41	10	8	55·5
,, 18,	13	139	34	94	28	6	7	46·15
,, 25,	30	89	14	55	14	19	11	63·3
October 2,	17	92	39	72	50	6	11	35·3
,, 9,	22	82	19	54	29	14	8	63·63
,, 16,	16	62	58	43	42	11	5	68·75
,, 23,	21	53	42	96	8	10	11	47·62
,, 30,	11	120	12	69	43	5	6	45·45
November 6,	9	127	6	96	33	3	6	33·33
,, 13,	11	75	32	57	18	9	2	81·81
,, 20,	7	28	12	16	51	6	1	85·5
,, 27,	2	91	7	76	7	1	1	50·0
December 4,	1	84	0	52	0	—	1	—
,, 11,	—	—		—		—	—	—
,, 18,	1	26	0	19	0	1	—	100·0
Weeks, 18,	197	105	16	77	11	106	91	53·8

As regards this (Mater Misericordiæ) hospital the epidemic lasted 18 weeks, during which period a total of 197 cases were admitted. The average duration of illness of these cases, recoveries and deaths both included, was 105 hours and 16 minutes, and the average period in hospital, 77 hours and 11 minutes. Total mortality, 106, or 53·8 per cent. of those attacked, and the recoveries, 91.

It will be seen that whilst the largest number of admissions took place in the last week of September and the first half of October, the greatest per cent. mortality occurred during the first half of October and the middle (13th to 20th) of November. The first two weeks of October were, therefore, the most signalized, both in regard to the number of cases admitted, and the death-rate.

TABLE 2,

Showing ages of patients within decennial periods, previous state of health and habits, average duration of illness, period in hospital, and result:—

Ages of Patients	No. of cases	Previous health and habits			Average duration of illness in hours	Average period in hospital, in hours	Result		Per cent mortality	Per cent. in good health	Per cent. in bad health
		Good health	Bad health	In-tem-perate			Died	Re-coverd			
					H. M.	H. M.					
Under 10 years	37	32	5	—	93 40	69 3	20	17	54·0	86·48	13·51
10 to 20	27	18	9	—	159 8	113 24	9	18	33·3	66·66	33·33
20 to 30	47	36	10	6	100 34	77 11	19	28	40·4	76·6	21·27
30 to 40	35	29	6	10	64 23	36 21	22	13	62·9	82·86	17·1
40 to 50	26	21	5	2	85 7	50 36	19	7	73·07	80·8	19·2
50 to 60	14	12	2	—	44 46	25 3	12	2	85·7	85·5	14·3
60 to 70	7	4	3	—	178 34	92 8	3	4	42·85	57·14	42·86
70 to 80	4	2	2	—	45 37	30 0	2	2	50·0	50·0	50·0
	197	154	42	18	96 28	61 43	106	91	53·8	78·17	21·3

TABLE 3 A.

Showing number of persons, within decennial periods of age, admitted in stage of *choleraic diarrhea*, average period in hospital, treatment, and result:—

Age	No of Cases	Average period in hospital	Treatment [a]	Died	Recovered	Mortality
		H. M.				
Under 10 years	6	40 0	Dilute sulphuric acid and tincture of opium, creasote water *ad libitum,* warm applications and sinapisms, hand friction, - -	—	6	—
10 to 20	7	97 43	6 Dilute sulphuric acid and opium, &c., as above mentioned, 1 chalk mixture, - -	—	7	—
20 to 30	19	84 51	12 do. do. do. In one case this was preceded by a draught of castor oil, and in another it was followed by calomel given as stated · below. 1 took tinct. opii. m.x. mixed in an ounce of brandy. Calomel was then given, followed by bismuth and chlorodyne draughts. 1 an oil draught with tinct. opii., and creosoted water for drink. In 4 cases purgatives were given, and one was treated expectantly, - - - - - -	—	19	·—
30 to 40	10	55 54	In one case acid and opium mixture, with creasote, and external heat constituted the treatment. In 4, acid and opium; 1, calomel and creasote; 2, chalk mixture; 1, expectant, - - - - - - -	—	10	—
40 to 50	4	31 37	In 1, tinct. opii. with nit. spirit of ether and camphor mixture was given, preceded by draught of castor oil. In 1, oil draught, followed by calomel in the usual doses. 1, chalk mixture; 1, acid astringent do. -	1	3	—
50 to 60	2	59 30	Acid astringent mixture, - - -	—	2	—
60 to 70	4	127 0	1, acid astringent mixture; 1, calomel, followed by bismuth, chloric ether, and tinct. opii. in camphor mixture; 2, chalk mixture,	1	3	—
70 to 80	2	44 0	1, chalk mixture; 1, spirit ammonia aromat. with tinct. opii., - · - -	—	2	—
	54	67 34		2	52	3·7

[a] For details of treatment, see Table 4, A and B.

N.B.—A third instance of death, the patient having been admitted in the stage of choleraic diarrhea, occurred in hospital (viz. Case 3, page 358), and was, by inadvertence, not taken account of till after the calculations for Table 3 A had been made. This case, therefore, does not appear in that table; but allowance can be made for it in estimating the per cent. mortality amongst patients admitted in the stage of choleraic diarrhea.

TABLE 5,

Showing the number of cases in which premonitory diarrhea existed; its average duration; the order of occurrence of the three principal symptoms, viz., purging, vomiting, and cramps; number of cases in which there were assignable causes (exclusive of neglected premonitory diarrhea and contagion); number of cases in which the attack was fairly traceable to contagion:—

Total number of cases	Number of cases in which there existed premonitory diarrhea	Average duration of premonitory diarrhea (in hours)	Order of occurrence of the principal symptoms, viz., purging, vomiting, and cramps	Number of cases in which the attack was due to any assignable cause, exclusive of neglected diarrhea or contagion	Number of cases in which the attack was fairly traceable to contagion or infection
197	65	96	CASES P. V. C., 39 V. P., - 37 P. V., - 30 Not stated 30 V. P. C., 26 P., - 13 P. C., - 5 C. P. V., 4 C. V. P., 3 C., - 3 V. C. P., 2 P. C. V., 2 V. C., - 2 C. P., - 1	Intemperance, - 18 (9·1 per cent.) Foul water, - 3 Eating cockles, - 1 Eating cold cabbage, 1 Eating fish, - 1 Eating pork, - 1 Eating badly cooked cabbage, - 1 Drinking sour porter, 1 Dentition, - 2	43
197	65 (33 ⅌ cent.)	96	Total, 197	Total, - - 29 (14·7 ⅌ cent.)	43 (21·8 ⅌ cent)

It is unnecessary to make any comments on this table, which speaks for itself. It is well, however, to direct special attention to the large proportion of cases (33 per cent.) in which *neglected* diarrhea was the assigned cause of attack; and when the remarkable prevalence of diarrhea during an epidemic visitation of cholera is borne in mind, the above figures become very significant. The importance of promptly attending to diarrhea during such periods is still further enhanced by the striking illustration afforded by Table 3 A, of the *curability* of the disease, even in the more advanced stage of choleraic diarrhea, as indeed by all the returns recently made to the College of Physicians from the hospitals of Dublin in which cholera had been treated during the late epidemic.

The large percentage of cases in which the attack was attributed to the excessive use of alcoholic stimulants is likewise noteworthy. Scarcely any recoveries took place amongst patients habitually intemperate. The large proportion of cases (21·8 per cent.) in which the attack was presumably attributable to contagion is worthy of remark. Cases of cholera had occurred in the houses, or the imme-

diate families, of all the patients (43) included in this category, and in each of them, likewise, direct personal exposure was clearly established. In several instances three or four persons stricken with cholera were admitted from the same house.

TABLE 6,

Showing the number of cases in which secondary fever occurred—the sex and ages of the patients—the period of access—the duration, and the result:—

No. of cases	Sex		Age, in years	Date of Access	Duration, in hours	Result	
	Male	Female				Died	Recovd.
1	1	—	24	5th day of illness	24	1	—
2	—	1	48	2nd ,, ,,	120	—	1
3	1	—	19	6th ,, ,,	216	—	1
4	1	—	46	3rd ,, ,,	51	1	—
5	1	—	26	5th ,, ,,	144	1	—
6	—	1	16	8th ,, ,,	120	—	1
7	1	—	6½	4th ,, ,,	72	1	—
8	1	—	22	4th ,, ,,	109	—	1
9	1	—	42	10th ,, ,,	96	1	—
10	—	1	20	4th ,, ,,	72	1	—
11	1	—	24	10th ,, ,,	72	—	1
12	—	1	16	3rd ,, ,,	528	—	1
13	—	1	16	9th ,, ,,	48	1	.
14	—	1	61	3rd ,, ,,	168	1	—
15	1	—	7	4th ,, ,,	96	—	1
16	—	1	17	3rd ,, ,,	72	—	1
17	—	1	46	9th ,, ,,	96	—	1
18	1	—	35	3rd ,, ,,	48	—	1
19	1	—	8	9th ,, ,,	96	—	1
20	1	—	8	4th ,, ,,	172	—	1
21	1	—	19	5th ,, ,,	144	1	—
22	—	1	16	3rd ,, ,,	340	—	1
23	1	—	1½	8th ,, ,,	96	—	1
23	14	9	—	From 2nd to 10th day,	Av. duration, 139 hours.	9 ℔ cent. 39·13	14

TABLE 7,

Showing the number of cases in which calomel was used; the average quantity taken by each patient; the number of cases in which mercurial action followed its use; and the result.

No. of cases in which calomel was used,   -   100
Average quantity given, in grains,   - -   35 grains.
No. of cases in which mercurialization followed
    its use, - - - - - -   4
Result—Died, - - - - - -   69
        Recovered, - - - - -   31

TABLE 8,

Showing the number of cases in which *rubeola cholerica* appeared; the ages of the patients; form of preceding disease; stage of the disease at which it occurred; period of its access; length of time during which it lasted; quantity of calomel taken, if any; mercurial action, if any; and result:—

No of cases	Age of Patients (in years)	Form of Antecedent Disease		Stage of the disease at commencement of Rubeola Choleria	Period of access after commencement of illness (in hours)	Duration (in hours)	No. of grains of calomel taken, if any	Mercurial action, if any	Result	
		Choleraic diarrhea	Algid cholera						Died	Recovered
1	1½	—	1	Secondary fever,	208	48	25	—	—	1
2	8	—	1	Ditto,	220	48	77	—	—	1
3	16	—	1	Ditto,	292	72	10	—	—	1
4	16	—	1	Ditto,	192	60	24	—	—	1
5	19	—	1	Ditto,	192	72	42	—	—	1
6	24	1	—	Ditto,	240	72	50	slight	—	1
7	46	1	—	Ditto,	53	24	none	—	—	1
8	46	—	1	Ditto,	268	48	none	—	—	1
Total, 8	—	2	6	Secondary fever, 8	Av. period of access, 208⅛ hours	Av. duration, 55½ h.	—	1	—	8

TABLE 9,

Showing the number of cases, and per cent. mortality, in the aggregate, and in the two sexes.

	No. of cases	Died	Per cent. mortality
Males, - - - -	91	53	58·6
Females, - - -	106	53	50·0
Total, - - - -	197	106	53·8

TABLE 4 A,

Showing the comparative results of different plans of treatment in the two stages of the disease; and the period under treatment:—

CHOLERAIC DIARRHEA.

Medicines given	Mode of Administration	No. of Cases	Average period of treatment, in hours	Result		Per cent. mortality
				Died	Re-covered	
Sulphuric acid and opium, Mustard cataplasms, and external heat applied by means of hot water jars and cushions. Creosote water for a drink. In a few cases a dose of castor oil.	To an adult 10 drops of aromatic, or dilute sulphuric acid with 5 drops of tincture of of opium in an oz. of water, were given after each liquid stool. To children proportionately diminished doses; in many cases were added a few drops of tincture of capsicum, myrrh, and camphor, - - Assiduously applied until the subsidence of all urgent symptoms. Creosote water ad libitum—made by adding 3 drops of creosote to a pint of water, Castor oil was given when there seemed to be liquid accumulation in the bowels. In one case the acid failed until the oil had been given, and had acted.	30	63¼	—	30	—
Chalk mixture with aromatics. Mustard cataplasms and extl. heat as above. Creosote water as above.	To an adult was given, after each loose motion, an oz. of chalk mixture with 5 grains of aromatic confection, 10 drops of aromatic spirit of ammonia, and a like quantity of chloric ether. In some cases a few drops of laudanum were added; and in others, ½ dr. doses of tincture of catechu. For the most part this method of treatment was used only in the milder cases, -	10	89	1	9	—
Calomel. Mustard cataplasms and external heat as above. Creosote water as above.	To an adult 10 grs. of calomel were at once given, and subsequently 2 grs. every hour, or second hour, according to the urgency of the symptoms. When the stomach was irritable, a draught was given after each dose, consisting of liqr. bismuthi dr. i., chlorodyne, 10 drops; water, oz. i.; or liquoris bismuthi and ætheris chlorici, guttas, xv.; tinct. opii, guttas iv.; mixt camphoræ ad oz. i. - A dose of castor oil was given when indicated by the presence of accumulated fluid in the intestines. In one case the acid and opium mixture was given without effect before the calomel treatment was commenced, and in this case likewise, previously to the administration of the calomel, three draughts were given—one every second hour—consisting of tincture of opium, 10 drops, in ½ oz. of brandy.	5	114⅓	1	4	—
Purgatives. Mustard cataplasms and external heat, as above. Creosote water, as above.	Either a haustus olei ricini, or haustus rhei; usually combined with aromatics, and a few drops of tincture of opium and peppermint water—repeated, if necessary. Adopted in cases where imprudence of diet was the apparent cause of the attack, - - - - -	5	53¾	—	5	—
Expectant treatment. Mustard cataplasms and external heat, as above.	This treatment was adopted only in cases which appeared to be progressing to recovery, - - - - -	2	55	—	2	—
Diffusible stimulants, with opium. Mustard cataplasms and external heat, as above. Creosote water, as above.	Scruple doses of sal volatile and chloric ether, with 5 drops of laudanum, every hour until symptoms abated, - -	2	70	—	2	—
		54	hrs. min. 74 37	2	52	3·7

TABLE 3 B,

Showing number of persons, within decennial periods of age, admitted in stage of *collapse* (algid cholera); average period in hospital; treatment; and result:—

Age	No. of Cases	Average period in hospital H. M.	Treatment*	Result Died	Result Re- covrd.	Per cent. mortality
Under 10 years, -	26	86 1	21 were treated with calomel. In 3 of these cases concentrated solution of camphor was likewise given, and in 2 also inhalations of the nitrite of amyl; 1 was treated with the warm bath; 4 with diffusible stimulants, and in 1 of these amyl inhalations were likewise given; 1, arsenic; sinapisms and creasote water generally, - -	15	11	57·69
10 to 20 -	19	135 56	In 13 calomel was given; and in two of these also a draught consisting of liquor bismuth dr. i, creasote m. ii.; clorodyne m. x. in water oz. i. after each dose of calomel. In two cases in which there was intermitting action of the heart, sulph. quiniæ was given in doses of gr. i. ½ and grs. ii. every 4th and every 3rd hour respectively, in 1 combined with chloric ether. 2 got stimulants; 4 diffusible stimulants with effervescents. In one case in which there was suppression of urine in the consecutive fever, the patient ultimately recovering, a diuretic draught was given every 2nd hour, consisting of tinct. digitalis m. x.; spirit juniper, dr. i.; spirit ether nit., dr. ii.; aquæ ad., oz. i. M. -	7	12	36·8
20 to 30 -	25	79 2	21 were treated with calomel, preceded by a draught of castor oil, in 4 cases; and in 9 followed by bismuth and chlorodyne draughts; oxygen inhalations were given in 2 cases, and nitrite of amyl do. in 1; venesection was practised in 1 case; 2 got diffusible stimulants and effervescents; 1 belladonna and permanganate of potass; and 1 arsenic, - - - - - -	17	8	68·0
30 to 40 -	19	32 53	15 calomel, with sinapisms, heat, and friction; of these 3 got brandy, 1 spirit of camphor, and 1 amyl inhalations. In 1 case permanganate of potass constituted the treatment, and in 1 hyposulphite of soda, in doses of gr. x., in combination with co. tinct. of cardamoms and syrup of poppies of each dr. i. every 2nd hour; to these draughts tinct. digitalis (m. x) was subsequently added, and the patient was dry cupped over the loins, in consequence of suppression of urine. 2 were treated with stimulants, - - - - -	16	3	84·2
40 to 50 -	20	58 50	14 calomel; and in 5 of these also a draught consisting of liq. bismuth, creasote, and morphia, was given after each dose of calomel. Camphor in 2; amyl inhalations in 1, and oxygen do. in 1. In 2 cases a draught of castor oil was given before commencement of calomel treatment. In 2 diuretic draughts of tinct. digitalis, n. s. ether, and s. juniper, were given every 2nd and 3rd hour respectively; 2 were treated with stimulants, -	16	4	80·0
50 to 60 -	10	24 48	9 calomel; in 1 of these bismuth, &c., draughts, in 1, also hyposulphite of soda, and in 1 oxygen inhalations were given. In 1 case there was no time for treatment, the patient dying half an hour after admittance, - - - - - - -	10	0	100·0
60 to 70 -	3	43 7	1 calomel; 2 diffusible and alcoholic stimulants— viz , sulph. ether, aromat. spirit of ammonia, spirit of camphor, and brandy; external heat, - -	2	1	66·66
70 to 80 -	2	16 0	2 calomel; and in one of these diffusible stimulants also; external heat, - - - - -	2	0	100·0
Total, -	124	59 34		85	39	68·5

* For detailed account of the mode of administering the various medicines above-mentioned we beg to refer to Tables 4 A, and B.

TABLE 4 B,

Showing the comparative results of different plans of treatment in the two stages of the disease, and the period under treatment:—

ALGID CHOLERA.

Medicines given	Mode of administration	No. of cases	Average period of treatment, in hours	Result		Per centage of deaths
				Died	Re-covered	
Calomel. Mustard cataplasms, and external heat applied by means of hot water jars and cushions, were assiduously used. Creosote water (3 drops to the pint) for a drink. Diffusible stimulants at short intervals. When the vomiting was urgent the epigastrium was at once vesicated by the nitrate of silver.	To adults with urgent symptoms, gr. x. were given at once, and gr. ii. every half hour or hour afterwards, till a favourable change occurred or all hope was abandoned. To children proportionate doses. The calomel was placed on the posterior part of the tongue, and if rejected by vomiting, a draught was given after each powder, consisting of solution of bismuth, dr. i., creosote guttas iii., tinct. opii guttas v., aquæ ad oz. i. m. Occasionally the creosote was replaced by 10 drops of chlorodyne. The circulation was fostered by hand-rubbing with flannel pads, and sometimes with chloroform liniment, or equal parts of chloroform and sal volatile; also diffusible stimulant drops were given every 10 or 15 minutes, consisting of equal parts of tincture of camphor, tincture of capsicum, sulphuric ether, and sal volatile; 20 drops for a dose, in water. In cases where the calomel was constantly rejected mercurial inunction, with the addition of mercurial suppositories, was adopted.	95	73¾	68	27	71·579
Stimulants and sedatives. Brandy, camphor, ether, ammonia, creosote, chlorodyne. &c. Mustard cataplasms and external heat, as above Creosote water, as above.	Brandy was given to adults in doses of oz. i. to oz. ii., in water, every hour, or oftener, according to urgency of symptoms; 10 drops of tincture of camphor on a piece of lump sugar every 10 minutes, or the diffusible stimulant drops mentioned above. Chlorodyne and creosote were added in small doses where the severity of the vomiting appeared to call for them; these stimulants were sometimes given in iced water, or iced soda water. In some cases vesication of the epigastrium by the nitrate of silver.	21	55	12	9	57·14
Effervescents, viz., bicarbonate of soda and sal volatile, with lemon juice. Mustard cataplasms, external heat, and creosote water, as above.	Two tablespoonfuls of a solution of bicarbonate of soda, with 20 drops of aromatic spirit of ammonia, taken with 1 tablespoonful of lemon juice, every hour, or second hour, according to circumstances. In some cases vesication of the epigastrium.	3	142½	1	2	33·33
Arsenical treatment Mustard cataplasms, external heat, and creosote water, as above.	Thirty drops of Fowler's solution in a tablespoonful of water at once, and 15 drops every quarter of an hour after until relief ensues. Vesication of the epigastrium with the nitrate of silver.	2	100½	1	1	50
Permanganate of potass and extract of belladonna. Mustard cataplasms, external heat, &c., &c., as above.	Dr. i. of the officinal solution of permanganate of potass with 10 drops of chlorodyne in an ounce of camphor mixture was given every third hour. Small doses of extract of belladonna, in pill, at intervals.	2	73	2	—	100
Hyposulphite of soda Mustard cataplasms, external heat, &c., &c., as above.	Gr. x. of the hyposulphite of soda, with dr. i. of compound tincture of cardamoms and dr. i. of syrup of poppies in oz. i. of camphor mixture, every second hour. Subsequently, owing to suppression of urine, 10 drops of tincture of digitalis were added to each draught, the loins were cupped and mustard poultices applied.	1	37	1	—	100
		124	80h.17m.	85	39	68·5

NOTE TO TABLE 4 B.—It will be observed that on adding the cases in Table 4 A and B a deficiency of 19 cases, out of the total of 197, will appear. These 19 cases are those of patients admitted in a moribund condition, and who were either dead before being carried into the hospital, or died immediately after. Such cases offering no opportunity for treatment, are rejected from these tables, which illustrate the effects of various modes of treatment.

We now propose to make a few general remarks on those points connected with cholera upon which we have not yet touched; and first, with reference to the disputed point of *Contagion*.

A most important question for a community amongst which cholera has actually entered, and scarcely less so for one threatened with its visitation, is, whether that disease is communicable by personal intercourse, or through the medium of clothes, furniture, merchandise, &c. It is our decided opinion that cholera may be communicated in both these ways, and *that it is therefore contagious*, but in a degree inferior to many endemic diseases; for example, small-pox, typhus fever, scarlatina, measles, and hooping cough. This question is of such vast importance at the present time, that we hope to be excused for adducing in support of the opinion just given, not only the evidence afforded by our own experience during the late epidemic, to which this report has immediate reference, but likewise such examples of personal and fomitic contamination from other sources as seem well established.

The late Dr. Graves[a] gives the following instances. The first was communicated by Mr. Ellis:—" A fisherman, named Kenny, seeking the price of oysters sold to a person living in Great Britain-street, in Dublin, was told that the party who owed him the money was lying dead of cholera in the room adjoining the shop or cellar; he waited, however, until he obtained the money, and on his passage from Dublin to Arklow, was attacked with cholera, and died on the following day in his own house. The second and third cases of cholera which happened in Arklow were persons who had been in attendance on this fisherman, and his wife and child were the fifth and sixth cases."

This statement has reference to the epidemic '48-49—Arklow having been, previously to the importation by this fisherman, free from cholera.

The following case, of which an extract is given, was reported to Dr. Graves by Mr., now Sir William Wilde:—" For many weeks the sanitary cordon (around the village of Kilmaine, which is on the road between Galway and Castlebar, both places then devastated by cholera) was preserved with great strictness, and no one was permitted to remain in the town, who, it was believed, had come from any of the infected places around, until a family removing from Galway to Castlebar arrived late at night in the

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[a] Dublin Quarterly Medical Journal, February, 1849, page 36 *et sequent.*

village, unknown to the police or the usual watchers, and took up their residence at the house of a man named Mulvey, a shoemaker, where they remained till morning, but departed early, fearing the police. I subsequently learned that this family proceeded to Castlebar, the wife being at the time ill of cholera, where she died a few hours after her arrival. The next day the shoemaker in whose house the family had sojourned for the night, was attacked with cholera. The case lasted more than two days, and the man appeared to die of the consecutive fever."

Deputy Inspector-General Barrow[a] gives the following strong exemplification of the spread of cholera by contagion;—we give an epitome of his report. The emigrant steamship, " England," left Liverpool for New York on the 28th March, 1866, having on board 1,200 persons, including the crew. On the 2nd April cholera broke out amongst the passengers, and on the 9th the ship put into Halifax in distress. The disease spread so rapidly on board that in the twelve hours ending on the morning of the 11th, *forty deaths* had occurred. On the day of the ship's arrival at Halifax (9th), a pilot boat containing three persons, a pilot, named Terence, an assistant, Purcell, and the son of the latter, approached the ship, and were by it towed to some distance by means of a ten fathom rope, and having sent their official papers on board, they departed without having boarded the ship. Purcell returned to his home, a distance of eleven miles from Halifax, on the following day (10th); on the 11th he had an attack of diarrhea; this continued; and on the 15th vomiting was superadded. On that day two of his children, aged three and five and a half years respectively, were seized with vomiting and great weakness; on the 16th his eldest daughter, aged fifteen years, was attacked with all the symptoms of true Asiatic cholera followed by severe consecutive fever. There were no deaths in this family. Mr. Barrow, who visited the man's house, and obtained the particulars from himself, declares that the house was in a high sanitary condition as regards situation, air, and cleanliness.

Terence again visited the " England" on the 10th, as pilot to the block-ship " Pyramus," to be used as an hospital, and having received back his papers sent on board the preceding day, he returned to Halifax without having gone on board the " England,"

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[a] Narrative of the late outbreak of Asiatic cholera on board the steamship " England," by Deputy Inspector-General Barrow, P.M.O., Halifax, N.S., in Army Med. Reports for 1864.

as affirmed both by himself and the captain of the ship. On the night of that day (10th) he was seized with purging, vomiting, and cramps, in a lodging-house in Halifax, and next morning returned home in a boat to Portuguese Cave, where Purcell lived; collapse set in, followed by low fever, of which he died on the 19th, after an illness of nine days' duration. On the 14th April, three days after Terence's return home, his daughter, aged five years, was seized with cholera, and died after an illness of fifteen hours. Next day (15th) three other children were attacked; of these, one, aged three years, had slept with her father; she died on the 17th with all the symptoms of cholera. Another, aged nine years, was seriously ill, but recovered after a consecutive fever; a third, aged one year, was on the point of death but recovered. Of five children in this family, only one escaped cholera, and he slept in a room apart from the others, and was out of doors all day; the mother also escaped. The cottage in which this family resided was also visited by Inspector-General Barrow, and found in a filthy state.

There had been no cases of cholera in Halifax or in the province for several years previous to this date.

It is noticeable, in connexion with this report, that there had been no direct personal communication between the passengers of the " England" and the men Purcell and Terence; nor was there any indirect communication between the former and the ship, except through the atmosphere. The attack in this case, therefore, must be regarded as an example of cholera *infection;* but in the case of Terence, there was indirect communication through the papers taken on board on the 9th, and returned to him on the following day; and, therefore, possible contamination also *per fomites.*

Dr. Hardie, surgeon 73rd Regiment, has recently,[a] in an excellent memoir on the doctrine of cholera-contagion, given the following example in support of the affirmative view:—" At this time I was quartered in the barracks of the Port of Flacq, a village and harbour on the opposite (windward) side of the island (Mauritius) to Port Louis, and twenty-one miles distant. All was apparently well at the port, so far as I knew, up to the 30th May. On that day a Mr. Rénaud came down from Port Louis (where cholera then raged) with his family, ten in number, on a visit of flight to Mr.

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[a] Illustrations of the Doctrine of Contagion in cholera, drawn from the Epidemics of 1854 and 1856 at Mauritius, read before the Cork Med. and Surgical Society, session 1866-67, and published in the Dublin Quarterly Journal, Feb., 1867.

Véron, whose family numbered twelve, exclusive of seven servants. The family occupied a small one-storied house of two rooms and outhouses.

" On the 31st I was called to see the infant child of Mr. Rénaud ill with purging and vomiting. The child, which was at the breast, had had diarrhea before leaving Port Louis. It recovered, but another of the children, aged three, died of cholera after forty hours' illness, on the 2nd June. From this day onward this house was a scene of constant misery and death. The child was buried on the 3rd, and the Rénauds returned to Port Louis the next day. The same day Mrs. Véron and her son, who had both been assiduous in their attention to the children, were seized with cholera; Mrs. Véron died that night, the son on the 6th. The eldest daughter was seized on the 7th. Mr. Véron was seized on the 10th, and died on the 12th. On the 14th another daughter died; on the 15th one of the servants; and on the 16th an old friend who had assisted in nursing them, died. Two servants died on the 18th, and on the 20th another servant and child. Two more of the family were attacked, but recovered.

In all, between the 31st May and the 21st June, there were sixteen cases in this one house, of which eleven proved fatal.

Contagion here showed itself in its full potency. The house, with its outhouses, was much too small for the original family. The overcrowding of ten more, laden with the germs of cholera, will adequately account for the pestilential outbreak, with its catastrophe.

Dr. Hardie very truly adds:—" No more direct proof of importation and contagion can well be adduced."

In the *Lancet* of August 11th, 1866, the following example of contagion is reported from Guy's Hospital. " A. B. and C. are sisters, and W. is their sister-in-law. A., who lived near Temple-bar, washed the clothes of a cholera patient, took the disease, and died. During A.'s illness, B. C. and W., who lived together in Park-street, Bermondsey, a locality then free from cholera, went to her, and after her death returned home. The same evening B. was taken ill with cholera and died the following morning. Two hours after *her* death, C. was attacked, and died within two days in the hospital, whither she had been brought. W., shortly after this death, was attacked in the morning with pain in the stomach and diarrhea; she was likewise admitted into Guy's Hospital, where she was treated for cholera, which passed on to collapse.

Deputy-Inspector General Maclean, Professor of Military Medicine in the Army Medical School, Netley, in a lecture, published in the *Lancet* of February 3rd, 1866, furnishes a strong body of evidence in support of the conclusion at which he has arrived, namely, to use his own words:—" That the pestilence is propagated by human intercourse, and in all probability, mainly by the poisonous action of the excretions of the affected after they have undergone certain changes."

In reference to this point, we would specially call attention to the recent account of the epidemic of cholera of 1866, in Bristol, published by Dr. Budd, in the *British Medical Journal* of April 13th, 1866.

Dr. Budd, in addition to other valuable information, gives very strong evidence to show that cholera is communicable by contagion; he says:—" From that time (21st July, 1866) to the 12th of November following, the disease made its appearance in twenty-four other distinct localities, making, in all, twenty-six infected spots. In five of these instances, as in the case from Rotterdam (making six altogether), the disease was distinctly traced to importation from without. In five others importation was probable, but could not be actually proved. In two the disease was derived from a previously infected spot in Bristol itself. In the remaining instances, to the number of thirteen, the source of the infection could be neither made out nor guessed." It would thus appear, that in addition to the first case, which Dr. Budd proves to have been imported in the person of a sailor from Rotterdam, where cholera was in active operation at the time, importation from infected centres was the immediate cause of attack in five instances. In five others it (importation) " was probable, but could not be proved," whilst in thirteen instances (each having, as in the preceding instances, a distinct locality in the city, and being the first case that occurred there, as shown in Dr. Budd's map), no clue could be obtained as to the mode of entrance of the disease.

From time to time examples of invasion similar to those last mentioned, will, of necessity, be presented, in which the contact theory fails to afford a full explanation. But are we in possession of *all* the facts connected with these cases? In the case of Mrs. Gaffney, given at page 376, we were all at fault for several days in regard to the mode of communication of cholera, till the circumstance of her having slept in an infected lodging-house the night before she was admitted into hospital, was accidently brought to light. If

this had not occurred her case would be regarded, as are many others of a similar kind, as affording negative evidence against contagion. The remarkable outbreak of cholera in the Mountjoy Prison on the 23rd December last, as reported by the medical officer, Dr. Macdonnell, to the College of Physicians, as also the two isolated cases that occurred in the General Prison at Perth, and were reported by Professor Christison and Mr. Thompson,[a] are simply inexplicable according to our present knowledge; but, it is worthy of remark, that both in Dublin and in Perth, cholera existed epidemically at the time these institutions were visited by it, and that the most rigorous measures of isolation and disinfection were immediately adopted. To this, no doubt, as in the case of the Bristol epidemic, the rapid disappearance of cholera from these two prisons should be ascribed.

The members of " International Sanitary Conference," in their report on the origin, &c. of cholera, given in abstract in the *Medical Times and Gazette* of October 6th, 1866, have arrived at the following, amongst many conclusions, viz.:—" All the facts at their disposal prove convincingly that cholera is propagated by man, and with a rapidity which is greater the more active and expeditious his migrations."

That " it is a law, up to the present time without exception, that cholera has never marched more rapidly than man in his migrations; that it has radiated to, and declared itself only in, those places where there have been communications with infected places, and in no others.

" The Commissioners are acquainted, up to the present time, with no fact to prove that cholera can be propagated to a distance by the atmosphere alone, whatever its condition may be."

In these conclusions the Commissioners were anticipated by twenty-six years, by the late Dr. Graves of this city, who, in his most learned and elaborate paper. " A Sketch of the Origin and Progress of Asiatic Cholera," published in January, 1840,[b] writes:— " *It is remarkable that it* (cholera) *never traversed the ocean at a rate exceeding that of ships.*"

Surgeon Leith Adams and Assistant-Surgeon Walsh, in their report on the cholera epidemics of 1865 at Malta,[c] state that the

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[a] British Medical Journal, Jan., 5th and 19th, 1867.
[b] Dublin Journal of Medical Science, Vol. xvi., Old Series, page 369.
[c] Army Medical Reports, 1864, page 331.

first undoubted case of cholera among the natives occurred, July 1st, at the village of Birchircara, in the person of a white-washer. This man had been employed two days previously at the Lazaretto, where the disease already existed, and died at his own residence, the case being returned as " gastro-enteritis."

In his report on the outbreak of cholera at Finglas, in 1854, Dr. C. F. Moore[a] states, on the authority of Dr. Hill, Medical Inspector, that " The first case of cholera was a labourer who had just returned from Belfast, and became ill after drinking a gallon of porter, and eating a liberal supply of bacon for his breakfast. This was on August 13th; he recovered, but shortly after, two cases occurred in the same house, in children, one of whom died on the 20th August." " The number of cholera cases recorded to the 24th September, from its first appearance on the 13th August, was sixty-six, of which twenty-eight proved fatal."

" It is said about 100 persons fled out of the village on the 18th and 19th, of whom it was ascertained five died within a few days, one in Liverpool, and the others within the environs of Dublin. Some of these refugees were the means of conveying the disease to another locality favourable for its development, where, in a few days, twelve persons died out of a very small number of inhabitants. The cottages, composing the hamlet (Kill-of-the-Grange), being badly ventilated and dirty, and the drinking water very indifferent."

A medical gentleman of this city has furnished us with the following particulars:—In August, 1849, two relatives of his, an old gentleman and lady, came up to Dublin from the country, with the view of spending some weeks at the seaside. They took apartments at Blackrock, and on the following day our informant was hastily summoned to visit the lady, who was reported seriously ill. On arrival at the railway station he engaged a car to drive him to his friend's lodgings, on approaching which, the driver, knowing he was a medical man, enquired in a very significant manner, whether " there was any one else sick there." On being questioned as to his meaning he declared that on the morning of the preceding day a person who had died of cholera had been removed for interment from that house. The lady who, as was afterwards ascertained, occupied the room and bed vacated by the cholera patient on the previous day, had a severe attack of cholera, from which she was convalescent, when her husband became affected with choleraic

[a] A Sketch of the Recent Outbreak of Cholera at Finglas. Dublin Quarterly Journal, Nov., 1854.

symptoms, and imprudently announced the fact to her. She was unfortunately of a nervous temperament, and, as a consequence of this startling intelligence, had an apoplectic seizure which carried her off. The husband, who was likewise attended by our informant, recovered after a protracted illness; but a servant of the house, who was subsequently attacked, died. These parties came from a part of the country where cholera had not appeared; they had no apprehension of danger from cholera, and were entirely ignorant of the antecedents of the house in which they lodged.

The recent importation of cholera from Liverpool, with the consequences of which we all have been made familiar, as detailed by the able and efficient officer of public health, Dr. Mapother,[a] affords a convincing illustration of the contagiousness of cholera.

Dr. Alderson[b] quotes from a French source experiments made upon animals with the *excreta* of cholera patients; these were given, soaked in bibulous paper, to the animals in their food.

No effects followed when the *dejecta* were administered three days after being passed; but when given between the third and the sixth day they produced most of the symptoms of cholera, viz.:— purging, cramps, suppression of urine, and convulsions ending in death. After the sixth day they were found to be inert.

M. Robin[c] has likewise proved experimentally the infectious property of the vomited and excreted matters of patients suffering from cholera, by injecting them into the veins and trachea of two dogs; to a third dog he administered the matter vomited by a fourth, which had drunk the blood and serum of a cholera patient. "In all there were vomiting and other symptoms of cholera."

The following case is extracted from our own Registry:—

Bridget Gaffney, aged twenty-seven, a native of the County of Meath, was admitted into hospital on the 6th November, '66, in charge of her infant, upon which she wished to have an operation performed for talipes. The woman was in good health, and occupied, with her child, a bed in the female surgical ward, on the second floor of the hospital. There was no communication whatever, direct or indirect, between the inmates of this ward and the cholera patients, who occupied two wards on the third or upper floor. Each of these wards had a separate staff of nurses and assistants, and no contact or approach was permitted, or possible, between the two

a Lectures on Public Health, Enlarged Edition, February, 1867, page 440.
b Lancet, January 12, 1867.
c Lancet, January 13, 1866.

classes of patients. The woman Gaffney was seized with cholera in the surgical ward on the morning of the 13th November, and was at once removed to the cholera ward up stairs, where she died at nine o'clock that evening. Some alarm was felt in consequence of this case, lest cholera was about to spread amongst the general patients of the hospital, and the most strict and searching inquiry was instituted, with the view of ascertaining whether the woman had approached the cholera wards, or been in any way exposed to contagion in the hospital. The result was the conviction that no such exposure had taken place, and that during the period of her residence in the hospital, previously to the choleraic seizure, she had not once gone beyond the adjoining corridor. No other patient was attacked with cholera in the hospital, either previously or subsequently. The uneasiness at first felt had entirely subsided, and Mrs. Gaffney's case had been placed in the category of cholera puzzles, when, on the 16th November, her husband came up from the country to take home the child, and in a conversation with one of the Sisters relative to his wife, remarked that on the night of her arrival in Dublin she had slept in a lodging house where cholera had been, and suggested that it was there she took the disease. Inquiry was at once set on foot to find out this lodging house, and ascertain all particulars relating to it. The result was as follows:— The house was 20 Greek-street; the woman Gaffney and her child slept there on the night of November 5th. In that house there had been a case of choleraic diarrhea on the 20th September; and in the adjoining house, No. 21, no less than five cases of well-marked cholera had been treated by the district medical officer in the interval between the 12th September and the end of October. From the next house but one, No. 22, one case of cholera had been admitted into the Mater Misericordiæ Hospital on the 14th Sept.; and from No. 24 two cases on the 14th and 17th September respectively. From No. 10 in the same street another case was admitted on the 23rd October.

Thus, on the night of the 5th November this poor woman had unconsciously placed herself in a *focus* of cholera; for, irrespectively of the case that occurred on the 20th Sept. in the house in which she stayed, there had been, within a short time previously, no less than *nine* cases in the immediate neighbourhood. It will be difficult te resist the conviction, indeed no other explanation seems admissible, that this woman, who had come from a district of the country where cholera had not appeared, received the poison of the disease

in the house 20 Greek-street on the night of the 5th November; and in the week from the 6th to the 13th November, during which she was in hospital, developed the germs so received into a fatal attack. In this case, therefore, it would appear that the period of incubation was *seven days*.

Upon reviewing the registry of cases admitted to the Mater Misericordiæ Hospital, we find that in a very large proportion contagion, or infection, are distinctly traceable.[a] It would occupy too much space to enter into the history of each in detail, but we cannot refrain from quoting the following instance.

On the 29th of October a young woman named Mary Hart, and her infant, aged two months, were admitted. Both were in the collapsed stage of cholera. The child died the evening after admission—the mother rallied, and was convalescent by the 4th of November. The history she gave was as follows:—She had been living in the County of Kildare, and had placed her child at nurse with a woman residing in Cork-street, Dublin. Hearing that this woman was ill, she came to town a few days before her admission to the hospital, and finding the nurse ill of cholera, took away her baby, which at that time was perfectly well. They went to a lodging in Kelly's-row, off Marlborough-street. Next day the baby sickened; the following day she herself took ill with vomiting, purging, and cramps, and, as before stated, both entered the hospital collapsed in cholera. It is not easy to set aside the belief that in this case contagion played an active part.

Many other confirmatory circumstances might be adduced, such as the appalling fatality amongst those students in Paris, who so heroically devoted themselves in the late epidemic to nurse-tending and hand-rubbing the cholera patients; but we shall confine ourselves to the mention of one more case which came under our special notice.

One of the writers of this report (Dr. Cruise) was called upon in the afternoon of the 26th of October to visit a clergyman at Clondalkin, in consultation with Dr. M'Crea. On arrival at four o'clock p.m., the patient was found collapsed in cholera, and despite of treatment he sank rapidly, and died that night.

The history of his case was as follows:—The night previous he was summoned from his bed to administer the rites of the church to a poor woman in Clondalkin, who was labouring under cholera, of which she died.

[a] See Table 5.

Having remained with her for some time, he returned to bed; awoke, ailing, next morning; sickened decidedly about eight o'clock, and soon had such marked symptoms that Dr. M'Crea of Clondalkin was called in. He at once pronounced the disease to be cholera, and prescribed accordingly.

Notwithstanding prompt aid the patient sank, and by the afternoon was in a hopeless condition.

Let us now investigate the history of the poor woman, in attendance upon whom this clergyman thus nobly sacrificed his life. The facts are these:—She had a brother who resided in Kingstown. A few days previously this brother took cholera and died. She repaired to Kingstown for the wake—remained there three days, and on her return to Clondalkin immediately took ill of cholera and died.

We think it difficult to resist the conviction that in these cases the propagation of the disease was effected by contagion. It may be urged by non-contagionists that such instances are merely coincidences; nevertheless we hold that a fair and natural interpretation of the doctrine of probabilities—and, in truth, all medical belief must finally rest upon probability, greater or lesser—leans irresistably in the opposite direction.

Receptivity and Resistance.—Immediately connected with the question of contagion in cholera arises that of the capacity of receiving or resisting its poisonous influence. A state of good health on the part of individuals and communities is eminently unfavourable to the invasion of cholera. By this assertion is not meant the absence of positive disease, but rather of that depressed standard of health, short of actual disease, in which most of the vital functions are performed indifferently; the appetite bad; the stomach and bowels deranged; sleep broken; the pulse slow and feeble; langour and depression of spirits habitual. This state of health, most frequently due to irregularities in diet, the use of unwholesome articles of food or drink, the respiration of impure air, or actual want of the necessaries of life, constitutes what is known as an " unfavourable hygienic condition." A state of individual and public health the reverse of this confers a vital resistance to the poison of cholera, or immunity from attack under circumstances of exposure to cholera contagion.

It occurs to us that herein may be found an explanation of the disagreement amongst physicians as to the contagious properties of cholera. Thus, one observer may witness an indubitable example of

contagion, or, perchance, many such, and become thenceforward an advocate of the doctrine of *contagiousness*. In this case or cases, presumably the two necessary conditions of exposure and receptivity were supplied, and hence the *positive* result witnessed.

Another person may have witnessed one or more cases in which, the degree of exposure being the same as in the former, contamination, nevertheless, did not follow, and may have become, in consequence, a staunch supporter of the doctrine of *non-contagiousness*. In the examples presented to him the condition of receptivity had been wanting, and hence the negative result from which he deduced his opinion. Let these two persons meet and discuss the subject of cholera contagion—each will probably unsettle the opinion of the other, and no definite conviction will remain to either.

Should the same individual have witnessed the opposite results mentioned, he cannot have arrived at any definite opinion on the subject, as deduced from his own experience, and will remain neutral in regard to this question.

In these hypothetical examples the error is one, not of fact, but of observation, and consists in the omission to take cognizance of the actual state of health of the parties exposed to the contagion. We feel certain that numerous examples, equally illustrative of of this error, might be adduced from actual practice, and that, to the confusion thence arising, may be in great measure attributed the present unsettled state of opinion as to the communicability of cholera from person to person.

The immunity from attack of infants at the breast, even when sleeping with, and subsisting upon the suck of cholera patients, deserves to be noticed in connexion with this part of the subject.

The following are examples of this kind :—

Dr. Maxwell Adams says :[a]—" In nine instances children at the breast escaped the disease, although their nurses laboured under it."

Dr. Brassington[b] mentions the case of a young mother attacked with cholera who continued, whilst in cholera, to suckle her infant child in the same bed with herself, as long as she had suck to give it. The mother died of the disease, as likewise did her little boy, aged two years, *but the infant was not affected.*

The woman Gaffney, who was attacked with cholera whilst an inmate of one of the surgical wards in the Mater Misericordiæ Hospital, as already stated, likewise continued to suckle her infant,

[a] Edinburgh Med. and Surg. Journal, Vol lxxii., 1849, p. 306.
[b] Medical Press and Circular, October 24, 1866.

ten months old, up to the time of her removal to the cholera ward. The mother died on the evening of her removal, but the child remained unaffected, and under observation in the hospital for three days, when it was taken home. It has been since heard of, and was at the time in good health. We may quote here another similar case :—

Eliza Young, aged 24, was taken ill with purging and vomiting in the forenoon of September 24th. At five o'clock, p.m., she was admitted into the Mater Misericordiæ Hospital, being then perfectly collapsed and livid, and having nursed her baby up to the time of admittance. The baby was then taken from its mother, who died the following day, *the child continuing unaffected.*

On the other hand, we have met one instance in which an infant at the breast appeared to have contracted cholera from its nurse, in the person of Mary Hart's child, mentioned at page 378.

Were infants, circumstanced as in the preceding instances, in a condition favourable to the development of the cholera poison, they could not escape attack, even though the mammary secretion were untainted, which is very improbable; for the infant, occupying the same bed with its nurse, must absorb in some measure the exhalations from her lungs and skin, and the vaporized excreta with which her dress and bedding are soiled. Yet no authenticated example, with the above single exception, of an infant so circumstanced taking cholera from its nurse has come under our notice.

A healthy infant, nourished exclusively at the breast, offers a typical example of a human body in a purely physiological or normal condition. Its food is unsophisticated, and contains, in the requisite proportions, the elements necessary for its sustenance and growth, *and no other.* Its sleep is regulated only by the requirements of its system, and its clothing selected and fashioned to retain warmth, without restricting the natural movements of the chest and abdomen. Such a condition of body, as being the antithesis of disease, is eminently antagonistic to the development or reproduction of morbific matter.

Similarly exposed to the contagion of small-pox, scarlatina, or measles, if unprotected by vaccination or by a previous attack, it is well known that infants rarely escape; but as the condition of body, and the degree of morbid receptivity is presumably the same in all these cases, the difference in the result must be due to the more intense infectiousness of the diseases mentioned as compared with cholera.

It is right, however, to mention that a case has been seen by one of the authors of this report in which a baby continued to suck its nurse up to the seventh day of typhus fever, and yet escaped without contracting the disease.

We are not disposed in this report, which is intended mainly as a commentary upon the result of our own observations, to enter upon a lengthened discussion of the arguments put forward by non-contagionists; we shall merely, in passing, allude to these most frequently dwelt upon.

It is often urged that cholera is not propagable by contagion, because cases occur under circumstances where it is impossible to trace their origin to this cause. We grant that such cases occur, but add in reply that the same must be admitted in reference to typhus, small-pox, and other acknowledged contagious diseases. Again, it is urged that cholera is not contagious because instances can be named of prolonged and thorough exposure without the spread of the pestilence. To this we answer that precisely analogous examples of non-propagation of typhus, scarlatina, &c., can be produced.

The greater number of physicians who have had large experience of cholera in India are non-contagionists. While we duly respect their opinions we cannot relinquish our own—namely, that cholera, as we have seen it in this country, and as the bulk of information upon the subject which we have been able to obtain, inclines us, is decidedly propagable by contagion, although in a lesser degree than typhus, scarlatina, and the like complaints.

In brief, we believe that cholera is propagable by contagion; that two elements play essential parts in its transmission—namely, *first*, the active element, or poison; and *secondly*, the passive element or capacity of receiving the poison. We think that there is no evidence hitherto brought forward to support the theory of non-contagiousness, which might not with equal truth, though in a different degree, be adduced to prove non-contagiousness in typhus, scarlatina, small-pox, and other diseases admittedly contagious. In fine, we conceive that the most righteous and humane course which we can take is to declare this opinion, regardless of the moral effect upon the multitude, convinced that the knowledge of the truth is the true key to the means of prevention of this terrible scourge, and the consequent saving of human life.

Atmospheric influence.—We have already expressed our opinion that in a limited space, the atmosphere may become so charged with

the poison of cholera, as to be capable of communicating the disease to receptive subjects who come within its sphere. It would seem also, that air so impregnated, if confined in a close space, may retain its specific contaminating property in undiminished potency for several months.

The following is an example in point, and is quoted from Dr. Hardie, Surgeon, 73rd Regiment.[a]

" About 300 yards from the sugar-mill of Clemencia we stopped at a closed shop, near which are several cottages of creoles, from whose account we got as follows:—

" During the first epidemic (1854, at Mauritius), about four months since, two persons, one of whom was the owner of the shop, had died of cholera, since when it had remained closed. On the 13th of this month (November), Madame Alfred, sister-in-law of the former owner of the shop, wishing to know if her shawl was in the house, had a window-shutter opened, put her head through the window and saw her shawl on the floor; she did not remove it, but remarked, on withdrawing her head from the room, that she was " *Frappée par la mauvaise odeur*." The same night she had looseness in the bowels. She went into the woods next day, but during that night became worse, and next evening cholera had fairly declared itself. She died on the 17th A child whom she had adopted, aged two, was taken ill the same evening, and died the same night."

This case is an example of *cholera infection;* for, it will be remembered, the woman did not even touch the shawl. It further shows that the air of a cholera apartment, confined for a period of four months, may, at the end of that time, communicate the disease.

In the course of the recent debate on cholera, at the College of Physicians, Staff Surgeon Major Laing, said:—" I was stationed in Kurrachee, in Scinde, in the month of June, 1848; cholera came on on the 14th of June, and in the first twenty-four hours one hundred men came into hospital. It appeared as if a cloud came across the sun; and at six o'clock that evening the men began to come into hospital; and before seven o'clock there were thirty men lying dead. The disease went on for ten days, and in that time we lost two hundred and forty men. The men suffered dreadfully; but of the officers in the cantonment only one was attacked, and he

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[a] Illustrations of the Doctrine of Contagion, drawn from the epidemics of 1854 and 1856, at Mauritius. Dublin Quarterly Journal, February, 1867, page 243.

recovered. The atmosphere was most oppressive. It was a remarkable fact that the Brahimine kites and crows which collected about the cantoments to pick up the offal *disappeared altogether, and did not return until all the cases of cholera had ceased.* The domestic fowls about the cantonment died; and I was told that the sheep in the neighbourhood suffered severely." These observations are of great value in reference to the question of atmospheric contamination, or the existence of an "epidemic constitution" of the atmosphere in districts actually suffering from cholera.

Fomites.—Of the communicability of cholera by fomites, such as the dress and bedding of cholera patients, the following examples are forcibly illustrative:—

The three first are taken from Dr. Graves paper.[a]   " Mr. Beatty, the apothecary who died in Sligo, was a Tirera man, and when he died his clothes were bundled up and sent to Tirera; the girl who took them to the river, where for safety they were sent to be washed, was attacked with cholera that night, and died."

The particulars of the three following cases were furnished to Dr. Graves by Dr. Nelson of Killala, in whose practice they had occurred.

" When the cholera raged at Ballina, as elsewhere, the panic was considerable; they buried clothing, and destroyed bedding, &c., by throwing them into the river Moy.

" About a mile down the river a fine feather bed was seen floating, by a woman, who carried it off about ten miles from Ballina, to the village of Mullinacrush. She was seized with cholera that night, and died in a few hours. Her sister, in the same house, sickened and died in a few hours after. Three children in the same house were all attacked, of whom one died, and the immediately adjoining houses were attacked. A female friend, who lived in an isolated cabin, visited this house, and was attacked immediately on her return, and died. No other cases occurred in the neighbourhood."

" Cholera first appeared in Tuam (Co. Galway), on the 4th of June, 1832, having attacked Galway, the nearest seaport, on the 12th of May preceding. The first case was a fish kedger's wife, *who had purchased the clothes of a woman who died in the cholera hospital of Galway.* She died the following night. Her sister, from a remote part of the town, who attended her and washed her body, was the second. A relative from a neighbouring village,

[a] Dublin Quarterly Medical Journal, February 1st, 1849, page 32, *et sequent.*.

who also attended her and assisted in the washing, was the third. None lived above twelve hours."

" Cholera ceased for the first time in Tuam in August. The bedding was all put up clean in store. In September the court-house (which had been our hospital) was required for the sessions. Mr. Hartnett, the dispensary apothecary, with two other persons, were employed for nearly a whole day in the removal of the stores. *Mr. Hartnett and one of the men were seized with cholera the follow-ing night, and both died.* There had not been a case of cholera in Tuam for upwards of a month." This case likewise exemplifies the retentive property of clothing in regard to the infectious principle of cholera, when stowed away, and not freely exposed to the air.

The next example is taken from the report of Surgeon Leith Adams, and Assistant-Surgeon Welsh[a] on the epidemic of cholera at Malta in 1865 :—

" On the 3rd of July it (cholera) proved fatal to a woman in Valetta. She was a tailoress, and had received, four days prior to her decease, old clothes, as patterns, from a merchant's family four-teen days arrived from Alexandria, in a vessel with cholera on board."

Deputy Inspector-General Barrow gives the following example of contagion by fomites:[b]—" A poor man named Evans, his wife, and two children, lived in a miserable and unwholesome house near the sea, at a place called Freshwater, the southern suburb of Halifax. A large quantity of bedding, saturated with cholera discharges, had been thrown overboard from the ship " England," and for many days allowed to float about the harbour. Some of this bedding had drifted ashore at Freshwater, and Evans' children had been seen playing with it; it is even more than suspected that the Evans family had lain upon a mattress so obtained. On the 22nd of April Evans' eldest child, a girl about two years, was seized with cholera, after having had diarrhea for nearly a week; she died next day in the city hospital. The entire family was then sent to the hospital, and kept in a state of isolation. On the 24th the second girl, aged thirteen months, was attacked; her case was severe, but she recovered. The mother, aged 35, was seized on the 25th, and died of exhaustion on the 30th. These cases (he adds) prove the infectiousness of cholera, and the communication of the disease by fomites (infected bedding)."

[a] Army Med. Report, 1864, p. 331.
[b] *Opus citat.* Army Reports.

Dr. Mapother,[a] writing of the recent epidemic in this city, says:— " The clothes of some cholera patients who had been in the Meath Hospital last August were sent to be washed by a woman residing in Chamber-street, where the disease had not been previously, and in three days she was seized with cholera, which proved fatal to her and to a man residing in the same house, and spread extensively in that street, which is built along the Poddle." [b]

The persistent adhesion of the poison of cholera to the dress and furniture of the infected, taken in connexion with the remarkable tenacity of its specific contaminating property, exemplified in some of the foregoing cases, would seem scarcely reconcilable with the opinion that it is of a gaseous, or of an inorganic nature; whilst, on the other hand, these characteristics are eminently distinctive of organic germs.

Water.—That water may serve as the medium of communication of cholera is now generally conceded. The following examples show the agency of water in the production of cholera in a strong light. Dr. J. W. Bain[c] writes:—" The same localities are attacked as before, but with one remarkable exception. In one entire street, where in the epidemic of 1849 forty-three persons died of cholera in a month, not one case has occurred. As this has never been published I may mention it now. The street is Cold Harbour, at Blackwall, running parallel to the river. About one-third of the houses face the river, and were supplied, in 1849, with filtered water from a barge coming out twice a week from the West India docks. The remaining two-thirds on the land side of the street were supplied with water from a pump. *Forty-one of the inhabitants of this side died*, and *only two on the other*, and it is believed that *these were in the habit of sending for the pump water*. After the epidemic had ceased it was discovered that the sewer in the rere of these houses, originally made of wood, had become rotten, and leaked into the well. I myself attended most of these cases, but at the time my attention was not drawn to the water supply, or its different distribution on the two sides of the street The forty-one deaths occurred in about twenty-nine houses."

Dr. Thomas More Madden, in his recent valuable brochure,[d] gives the following striking example of the contamination of pump-

[a] Lectures on Public Health, February, 1867.
[b] This statement, as regards the washerwoman, is confirmed in the abstract of report of cholera from the Meath Hospital.
[c] Lancet, September 1, 1866.
[d] A Statistical Inquiry into the Sanitary Condition of Kingstown, &c., 1867, page 5.

water:—" In one of the best terraces of Kingstown several deaths from cholera occurred, and measures of disinfection were adopted. At the same time the pump-water in one of the houses was observed to acquire suddenly a very remarkable and offensive taste and odour. An eminent chemist was now requested to analyse the water, and in it was found a large quantity of carbolic acid, together with organic matter. The explanation of this was, that a case of cholera had occurred next door, and that carbolic acid had been poured into the water-closet; and this led to the discovery of the poisonous character of the water."

Dr. Mapother[a] gives the following example of a similar kind:— " After two cases of cholera, one of which was fatal, had occurred in the house of a friend of mine, which is situated in one of the best parts of that town (Kingstown); he poured a quantity of carbolic acid into the sewer, and found that the water of the adjoining well tasted of that substance for many weeks after."

The following cases are copied from our own hospital record:— John Thomas, aged fifty-three, mate of the ship " Olive," from Liverpool, called the " teetotal ship," because of the strict abstinence from all spirituous drinks enforced on board, was attacked with purging, vomiting, and cramps, at $8\frac{1}{2}$ p.m., October 4th, and admitted into hospital at eight o'clock the following morning; he was then in profound collapse, and died at 3 p.m. the same day.

Thomas Hartley, aged sixty-three, captain of the same ship, was seized with cholera at ten o'clock on the evening of October 4th, and admitted into hospital at $9\frac{1}{4}$ a.m., on the 5th, in a moribund state, and died twenty minutes afterwards.

Willy Seamer, aged 17, cabin boy, also of the " Olive," who had attended the two former whilst sick on board, was attacked with slight choleraic symptoms at 11 p.m., on the 5th October, and was admitted at $10\frac{1}{2}$ a.m., on the 6th; he was then suffering from diarrhea, nausea, and occasional vomiting This boy, who was the only survivor of the crew of the ill-fated ship " Olive," was discharged cured after treatment in hospital extending over 168 hours.

Thus, on board this ship two persons were seized with cholera on the evening of the 5th October, and both died on the following day; and on the afternoon of that day (6th) the only surviving member of the crew was also attacked, but recovered after a protracted illness. Dr. Mapother[b] reports:—" The drinking water of

[a] *Opus citat*, page 458. [b] *Opus citat*, page 475.

the "Olive" was shown by Professor Cameron to contain *ten grains per gallon of organic matter,* and *infusoria visible to the naked eye.*"[a]

In the foregoing cases, as indeed in most others of the alleged communication of cholera by means of water used in drinking, it is impossible to prove the introduction of the choleraic agent through this medium. Indeed, in the majority of such cases we are of opinion that the impure water operates by creating a *predisposition* to attack, the principle of infection being supplied through the air, rather than by serving as the medium of communication. It is, however, conceivable, and highly probable, that cholera is frequently communicated in this way.

Sewers and Privies.—Of the unfavourable influence of ill-constructed and neglected sewers and privies, in close proximity to human habitations, during an epidemic of cholera, the evidence is conclusive. The following are examples:—

In Dr. Barry's report of the cholera epidemic of 1848 at Malta, as it affected the 69th Regiment stationed at Lower St. Elmo,[b] it is mentioned that "several cases of cholera occurred in rapid succession, and that it was specially noted that the greater number of cases were admitted from the rooms in the immediate vicinity of the common drain and men's privy; and that, moreover, on previous occasions these identical rooms had been frequently temporarily abandoned, on account of the great amount of sickness they had produced in comparison with others in the same barracks."

On the visitation of cholera to the same island (Malta) in 1850, Surgeons L. Adams and Walsh[c] state that the "Ospizio di Vecchi (a peculiarly unwholesome establishment) as usual came in for its share early in the outbreak, as well as the madhouse, where everything sanitary was most defective. Here the disease raged with great virulence, and the unfortunate inmates dropped off in numbers, until suspicion was aroused that the general state of filth, and an extremely noisome latrine, might have something to do with the evil. This was at once filled up with lime, and the cholera as quickly disappeared from the establishment."

On Professor Pettenkofer's theory of the mode of propagation of cholera we do not undertake to offer an opinion, beyond this, that the denial of the communicatibility of cholera by *direct contact,* as involved in that theory, seems very questionable, and is contrary

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[a] The italics are not in the original.

[b] Quoted by Drs. Leith, Adams, and Welsh, Army Med. Reports, 1864, page 313.

[c] *Opus citat,* Army Med. Reports, 1864.

to all our experience of the disease. Of this theory, which, in deference to the great reputation of its author, we feel bound to notice here, an excellent abstract has been published by Dr. H. Weber.[a] Pettenkofer believes that cholera is propagated by human intercourse, and never without this, *but through the soil*, and not by direct contact. The two essential conditions are, human intercourse yielding the germs in the excretions of cholera patients, and the soil developing this germ into activity. As regards the soil, he holds that two conditions are essential to the propagation of cholera, viz., a porous character, and the presence of ground-water, or sub-soil-water, varying between five and fifty feet below the surface, the level depending upon that of the first impermeable stratum.

The most fatal period is when this water recedes from the surface, viz., in July and August. The cholera-germ must be developed in a suitable soil before it can become active, and it may then enter the body by inhalation, &c.

We now beg to submit the result of our observations on the symptomatology and morbid anatomy of cholera.

Action of the Heart.—In collapse we have noticed, in several cases, a total absence of the second sound, the first sound being distinctly audible and normal in character. The failure of the second sound has taken place, first, in the aorta, and, after an interval of a few hours, but varying with the gravity of the case, in the pulmonary artery also. For some time longer the first sound continued to be audible, ultimately failing, and in a few instances several hours before death.

This phenomenon is noteworthy, as indicating a dynamic state of the heart, the antitype of that witnessed in typhus fever, in which, as Dr. Stokes has remarked, the *first* sound of the heart is occasionally abolished, the second continuing unimpaired. In typhus fever the failure of the first sound has been justly attributed to softening and muscular debility of the ventricles, as noticed by Louis. In cholera, as is well known, softening of the tissues of the heart does not occur; on the contrary, the walls of the ventricles, especially the left, have been found firmly contracted and unyielding in nearly every instance in which an examination of the body has been made within a few hours after death. Herein, we believe, an explanation is to be sought of the persistence of the first sound in cholera-collapse. The absence of the second sound is probably due to the want of sufficient tension of the aorta and pulmonary artery to induce strong elastic reaction, and forcible and sudden closure of the semilunar valves.

[a] Lancet, January 6, 1866.

It has been remarked by Skoda that obstruction of the pulmonary circulation, to whatever cause due, is followed, as a necessary consequence, by intensification of the second sound in the pulmonary artery ; hence he regards an accentuated second sound in this vessel as of great value in the differential diagnosis of mitral valve-disease, a remark, the justice of which we have frequently verified. That in the collapse of cholera there is obstruction of the venous circulation in the lungs, the engorged state of the pulmonary artery and right side of the heart, found after death, clearly shows ; hence, probably in the last stage of cholera, the continuance of a second sound on the right side for some time after it has ceased to be audible on the left.

The following cases, given in abstract, illustrate the foregoing statement :—

Case I.—Philip Sheridan, aged thirty-eight, was admitted into hospital at eight o'clock, a.m., on the 20th October, in a state of collapse. He had been intemperate ; and, for three weeks prior to the date of admittance, had been suffering from diarrhea, for which he received no treatment. There was no pulse at the wrist, *and the first sound of the heart only was audible* when he was admitted. Death took place two hours afterwards.

Case II.—Catherine Fitzpatrick, aged thirty, was taken ill at five a.m. on the 15th November, with purging and vomiting, and was admitted into hospital at ten o'clock on the same morning. She was then pulseless and livid. Rallied somewhat after inhalation of nitrite of amyl, the pulse becoming perceptible for a few minutes, but soon relapsed into her former condition, and died at half-past two o'clock on the evening of the 16th. In the afternoon of the 15th it was remarked that " the *second sound of the heart was not audible anywhere,* but the first sound was remarkably clear."

Case III.—Timothy Flynn, aged thirty-four, was attacked with diarrhea on the morning of the 12th November. In the evening vomiting set in, and in the course of that night severe cramps in the legs and abdomen. He was admitted into hospital at a quarter-past seven a.m. on the morning of the 13th, and at half-past ten was seen by the physician on duty. He was then in a state of incipient collapse ; pulse quick and very weak ; tongue furred in the centre, but clean and moist at the edge ; eyes sunken and areolated ; face pale ; surface, tongue, and breath cool ; finger ends livid and slightly corru-

gated; heart's impulse not perceptible; first sound faint, but distinctly audible; *second sound not audible over apex or right base, but audible over, and in course of pulmonary artery.* No urine passed since yesterday; patient to have digitalis draughts, and to be cupped and poulticed over the loins.

Nov. 14.—Patient is weaker; no urine passed; pulse barely perceptible; first sound of heart scarcely audible, *and no second sound to be heard anywhere.* Diarrhea continues, but not vomiting. Death took place at three o'clock that evening (14th), no urine having been secreted since the 12th.

Case IV.—Laurence Clinton, fifty-five years of age, was admitted into hospital on Monday the 26th November, at ten o'clock a.m. At four o'clock that morning he was taken ill with purging; at half-past six vomiting set in, and shortly afterwards severe cramps in the legs, thighs, and abdomen. On the evening of the 25th he took a full meal of bacon and cabbage, and to this he attributed the attack which occurred about ten hours afterwards. When visited at a quarter past eleven a.m. on the 26th he was livid; features collapsed; eyes sunken and areolated; tongue moist, coated, and cold, and the calomel shortly before given lay upon it; breath tepid; surface cold; finger-ends corrugated and livid; pulse at wrist barely perceptible, and not to be registered. Heart's action weak, *and only one sound to be heard, viz., the first.* Involuntary evacuation of bowels; no urine passed since he was attacked; ordered to have oxygen inhalations every third hour; to be dry cupped, and have mustard poultices over loins. After the first inhalation of oxygen it is noted that "the second sound was audible at intervals; but the second inhalation produced no such effect." This man died eight hours and a quarter after admittance.

Case V.—Laurence Toole, aged thirty-six, taken ill at five a.m. October 23rd, with vomiting, purging, and cramps, and admitted on the same day at nine a.m. He was then livid in the face, but not elsewhere; was cold, and tortured with cramps; conjunctivæ deeply injected; *neither heart sound* to be heard; no cardiac impulse to be felt. This man was treated with calomel, brandy, and mustard applications; he died at half-past eleven p.m. on the day of admission, having been in hospital fourteen and a half hours, during which he took gr. 38 of calomel.

State of the Pupils and Conjunctivæ.—This has been found to vary, not only in the different stages of cholera, but likewise in the

same stage in different cases.   In the stage of choleraic diarrhea the pupils are usually normal and equal; in a few instances they have been widely dilated in this stage, but these were instances in which the patients, having been exposed to the contagion, were profoundly alarmed at the appearance of the symptoms of cholera.

The following is an example :—

Denis Kelly, aged twenty-four, was attacked on the 8th September with diarrhea and sickness of stomach, and was admitted into hospital on the 10th; pulse full and quick; tongue coated; *pupils much dilated;* conjunctivæ injected; surface bathed in perspiration, and face presenting a remarkable expression of anxiety.   This man, who was a labourer in the employment of the Ballast Board, lived in the same house with a family named Corrigan, of whom one (the father) died in the hospital on the 4th, and another (a girl aged seven) on the 9th September.   Kelly was much alarmed at the close proximity of danger, and when himself attacked, was overwhelmed with fear. To this latter circumstance the dilatation of the pupils on admission was attributed; after a few hours the man's confidence was restored, and the pupils resumed their normal dimensions.   This patient had consecutive fever and choleraic rubeola, and was discharged cured after a residence in hospital of 312 hours.

No one state of the pupil is characteristic of collapse; it is, however, in this stage either widely dilated, or contracted to a minute point.   The former state (dilatation) is of much more grave significance, and is associated with more or less of coma and suppression of urine, and likewise with effusion into the cerebral ventricles, as we have found to be the case in four of our *post mortem* examinations.   In the consecutive fever the pupil is generally contracted in the early stage, but in fatal cases it becomes dilated towards the close, coma and suppression of urine supervening at the same time.

We have not met with a case in which the pupils were contracted in consecutive fever, at the same time that the patient was partially comatose, as has occurred in the experience of Dr. Munro,[a] nor can we subscribe the statement of Dr. Parkes[b] that in consecutive fever " the pupils are generally contracted," unless it applies exclusively to the early stage.

Case I.—John Morrow, aged forty-six, was attacked with diarrhea at eleven a.m. on the 19th October, and admitted into

[a] Report on the Epidemic Visitation of Cholera in the 93rd Sutherland Highlanders in 1862.—Army Med. Reports, 1862.

[b] Parkes on Cholera, page 132.

hospital at half-past nine a.m. on the 20th ; he was then in collapse ; no pulse at the wrist ; eyes sunken and surrounded by dark areolæ ; conjunctivæ injected with purple blood, *and pupils greatly dilated;* choleraic voice, and violent cramps ; he rallied under treatment with large doses of calomel (gr. x., immediately, followed by gr. ii., every hour), and a draught every second hour composed of bismuth, chlorodyne, creasote, and morphia. On the 22nd (third day of illness) reaction was fully established, and the patient was passing into the consecutive fever ; tongue dry ; pulse 108 and full; pupils contracted. At ten o'clock he had a rigor. The head was then shaved, and a cold lotion applied, and a draught was given every second hour containing tinct. digitalis, m. x. and nit. spirit of ether m. xx. 23rd. Pulse 102 and of moderate volume ; skin hot; tongue dry and crisped in the centre and at tip; *pupils dilated;* mind unaffected ; diarrhea and vomiting arrested. On being questioned, the patient admitted that he had not passed water for the preceding twenty-four hours. The loins were cupped to ℥iv., and the digitalis draughts continued. He wandered a little that evening, and somewhat later the *pupils became largely dilated;* he died comatose at two a.m. on the following morning (the 24th).

Case II.—Stephen Curtin, a boy twelve years of age, was seized with cholera on the 6th September ; admitted on the 7th at 3 a.m.; he was then pulseless, and perfectly livid ; *pupils dilated;* conjunctivæ injected and eyes prominent ; this boy moaned most piteously, and was remarkably restless.

Case III.—Michael Monks, aged forty-five, attacked with vomiting and purging on the morning of October 21st. On Monday the 22nd he was admitted into hospital at one o'clock a.m. No pulse to be felt ; surface cold and blue ; eyes sunken, and conjunctivæ injected ; secretion of urine suppressed. Treatment consisted in large doses of calomel, and warmth to surface. On the following morning (23rd) he had several epileptiform fits in rapid succession ; suppression continued, and *pupils became widely dilated* ; he died October 23rd, at three p.m.

Of the opposite condition (contraction) of the pupils in collapse, the following is an example :—

Case IV.—Mary Parrot, aged seventy, taken ill with diarrhea and vomiting at 3 o'clock in the afternoon of the 12th October. Admitted at eleven a.m. on the 13th, at which hour she was visited. The surface was then cold and livid, but not remarkably so. No

pulse to be felt at the wrist. Eyes sunken, and *pupils contracted to the size of pin-holes.* Well marked arcus senilis. Respiration slow and unembarrassed; no diarrhea, vomiting, or cramps, since admittance; calomel placed on the tongue was not swallowed. To have spirit of camphor-drops every few minutes; died at half-past two p.m., that is, three and a half hours after admittance. In one instance we observed inequality of the pupils a few hours before death. In that case the conjunctivæ were ecchymosed, and the eye, in which contraction of the pupil existed, was remarkably prominent; the other pupil was natural.

In the great majority of cases of collapse, and likewise in bad cases of choleraic diarrhea, the vessels of the conjunctivæ are injected with dark purple blood. Indeed, the peculiar appearance given to the eyes by this state of the conjunctivæ, conjoined with the characteristic tongue previously described, may be regarded as pathognomonic of cholera.

Consecutive Fever.—The fever of reaction has occurred only in a limited proportion (23 in 197) of the total number of cases. The period of its accession was from the second to the tenth day of illness—most frequently about the fifth day. Its average duration has been 139 hours, and the deaths have been to the recoveries in the proportion of 9 to 14.

This fever, which is rarely if ever witnessed in a severe form except consecutively to collapse, is characterized at its access by gradual increase in the rate and strength of the pulse, elevation of surface-temperature, and crisping of the tongue, and when fully pronounced, is distinguished by rapid and sharp pulse, hot and dry skin, headache, contracted pupils, and injected conjunctivæ; dry and brown tongue, suppression of urine, and return of vomiting. In fatal cases death has been usually preceded by coma.

In eight instances a remarkable cutaneous eruption has appeared in the course of the consecutive fever. This may be regarded as peculiar to the febrile stage of cholera, and more closely resembles measles than any other eruptive disease associated with fever. Hence we would designate it as " rubeola cholerica."

The surface of the entire body, but less frequently the face than other parts, is covered with large irregular blotches of a dark or lobster-red tint, usually discrete, and separated by portions of unaltered skin. There is generally cough, congestion of throat and conjunctivæ, and weeping from the eyes. But these last-mentioned

symptoms are not of invariable occurrence, as in true measles. The rash, like that of measles, passes off by desquamation.

It generally occurs in young subjects; the ages of those affected by it, having been, with two exceptions, under 25 years. In several instances it has occurred in the reaction from collapse, and likewise in the mild consecutive fever which occurs in convalescence from choleraic diarrhea.

The average period of its appearance after first illness has been 208 hours; and the time during which it remained out 55 hours. *In no instance has death occurred in which this eruption appeared.*

It has been attributed by some writers to the free administration of calomel or of opium in the treatment. In six of our cases calomel had been given. In one of these, a case of choleraic diarrhea in which 50 grains of calomel were taken, there was slight mercurial action; but in the others, which were cases of collapse, and made good recoveries, no evidence of mercurialization was exhibited.

In two of the cases opium was given, viz., those in which no calomel has been taken, and in these cases only in very small quantities.

We cannot therefore admit that the eruption in question is the result of the constitutional action either of mercury or of opium. We regard it, on the contrary, as peculiar, though not essential to cholera; as *eliminative* in character, and as affording strong evidence of the presence of morbific matter in the blood.

Doctors Woodman and Heckford[a] have had three cases of this rose-rash at the Limehouse District Cholera Hospital, London. No opium had been given in these cases, and calomel only in one (probably) before admission. It appeared in raised patches, more or less distinct; there was little or no itching or smarting; it made its appearance from the sixth to the twelfth day of illness, usually subsiding in about three days, and followed by desquamation. The urine was albuminous during the continuance of the rash, and in some cases after desquamation, and under the microscope was found charged with tube-casts and epithelium.

In the *Lancet* of August 11, 1866, is reported a case of choleraic roseola in a boy 16 years of age, who was taken ill with diarrhea on the 28th July, and admitted into St. Bartholomew's Hospital on the 31st. On the 7th August, *i.e.*, ten days after first illness, the rash appeared, accompanied by much itching.

[a] Lancet, September 29, 1866.

Doctor Sutton, of the Bethnal Green Hospital,[a] mentions another case of " roseola " in a child.   It appeared like nettle rash on the tenth day, and on the next it resembled roseola.

Doctor F. Makenzie[b] has seen six cases of roseola in cholera, in none of which opium had been given.

Doctor A. Clarke, of the London Hospital,[c] also reports a case of " roseola " in a child aged six years, who was admitted in collapse. On the tenth day reaction set in, and with it " roseola " on arms, which quickly became confluent.   It disappeared suddenly on the third day of eruption, and immediately violent and continuous cramps of hands and feet set in, lasting six days.   Ultimate recovery.

Also a second case, viz., in a boy seven years old, not collapsed, " roseola " appeared on the tenth day of illness, and disappeared on the third day of eruption.   Spasm of feet and legs set in immediately on the disappearance of the eruption, and lasted five days, when the boy died.

A case of " roseola " has been published by Dr. H. Weber,[d] the eruption appearing on the tenth day after attack, arms chiefly affected, but trunk and legs also.   Eruption resembled measles, but on the second day was of a more deeply scarlet tint.

In several of the cases of secondary fever we noticed a peculiar aphthous sore mouth as a very late symptom.   It in no wise resembled mercurial sore mouth, and appeared in one case in which no mercury had been given.   In one case, likewise, it gave rise to abscess in the substance of the soft palate, which required to be freely opened by incision.

Animal Temperature.—The observations which we have made upon this subject have yielded the following results :—

In a man aged thirty-six, dying in collapse, the temperature of the rectum five hours before death was $90\frac{2}{3}°$ F., and in the axilla $98\frac{4}{5}°$ F.

In a man aged twenty-four, suffering from choleraic diarrhea, the temperature, as registered on the fourth day of illness, was, rectum, $97\frac{2}{3}°$ F.; axilla $96\frac{4}{5}°$ F.

A boy, aged twelve, in incipient collapse, on second day of illness, and four days before death, the temperature in the rectum was $98\frac{1}{5}°$ F.; and in the axilla 97° F.   The pulse was then 102, and hardly to be felt; finger ends white and bloodless ; backs of hands presenting a dusky reticulated appearance.   Vomiting in *jets;* was drowsy.

a Lancet, September 22, 1866.   b Lancet.
c *Ibidem* September 8, 1866.   d *Ibidem,* August 25, 1866.

After inhalation of the nitrite of amyl the temperature in the rectum fell $1\frac{1}{5}°$ F., whilst the pulse descended eight beats.

The foregoing results will not warrant us in subscribing the opinion of Dr. M'Kenzie[a] that—" It may be stated as a general inference, from the observations made, that in proportion as the external temperature of the body is diminished, that of the internal passages (rectum, vagina, &c.) is increased."

In a few instances we have noted an elevation of surface temperature within an hour or two after death.

Incubation.—The period of incubation, by which we mean the time elapsing between the reception of the morbific poison and the first manifestation of specific symptoms, has been differently estimated. The "International Sanitary Conference" Committee state,[b] that in no well established instance has it extended beyond " a few days."

Dr. Parkes estimates it at from three to four days. Drs. Adams and Welsh[c] give examples which show that in their experience it has been from two to three days.

Deputy Inspector-General Barrow,[d] writing of the communication of cholera from the emigrant ship "England" to the men Purcell and Terence, and through the latter to their families, at Halifax, says:—" Of these nine persons one suffered on the second day after exposure; two on the third day; three on the fourth day; two on the fifth day, and one on the sixth. It would appear, therefore, that in the greater number of these cases cholera had developed itself from the third to the fifth day after exposure.

In the case of the woman Gaffney, already detailed in this Report, as illustrating the contagious property of cholera, the period of incubation was seven days.

In the cases of Mary Hart and her baby, and that of the clergyman at Clondalkin, the period was much shorter.

Cramps and loss of voice.—Cramps are, in our opinion, due to want of arterial circulation in the muscles, whether this be the result of spasm of the vessels, viscidity of the blood, or insufficient propulsive power in the heart. We believe that failure of voice is due to want of power in expiration, conjoined with " a diminished volume of air in the lungs," as stated by Dr. Parkes. In connexion

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[a] Lancet, August, 1866.

[b] Medical Times and Gazette, October 6, 1866.

[c] *Opus citat,* page 331, *et sequent.*

[d] *Opus citat,* Army Med. Report, 1867.

with this subject, a case of venous injection in cholera, recently published by Dr. L. S. Little of the London Hospital,[a] possesses much interest.   The case was the following : — A woman in the collapse stage of cholera, suffering from severe cramps, and with total loss of voice, was treated by alcoholic injection into the veins, to the amount of nearly ten pints ; *immediately after the injection, the cramps ceased, and the voice was restored* ; this patient recovered.

Treatment.— The general plan of treatment which we have pursued is sufficiently exhibited in Tables 3 and 4 A. and B. Very few remarks are therefore required here.

Creasote water, allowed *ad libitum,* and composed of m.iii. of creasote to a pint of cold water, we have found most beneficial, not only in appeasing the thirst, but likewise in allaying the irritability of the stomach.

Nitrite of Amyl.— In the year 1863 Dr. Richardson of London, reported upon, and exhibited, at the meeting of the British Association for the Advancement of Science at Newcastle, the action of this agent, administered by inhalation ; and again, at the meeting of the same association at Bath in the following year, he further illustrated its action.   When inhaled for a few moments, he showed that it is capable of so exciting the circulation, that the face becomes flushed, accompanied with a thrilling sensation.   It occurred to us, that in virtue of this remarkable property the nitrite of amyl might be useful in re-establishing the circulation in the collapse of cholera.

In one case, that of a man forty-two years of age, admitted in incipient collapse, the pulse rose from 102 to 114, and the temperature in the axilla from $95\frac{1}{2}°$ F. to $96\frac{2}{3}°$ F., after inhalation of the nitrite of amyl for three minutes.   The inhalation appeared to aggravate his thirst.

In another case, a woman, aged thirty-four, also in collapse, the pulse became perceptible after inhalation for a few minutes, and the patient seemed otherwise improved.   Thirst seemed aggravated by the inhalation in this case also.

A boy, aged four, in collapse, inhaled the amyl for a few minutes, after which there was a slight appearance of colour in the face ; the boy strenuously resisted its further administration, owing to the obstruction to free respiration which it occasioned.

In several other cases the amyl was tried ; but, although when

[a] Medical Press and Circular, Feb. 27, 1867.

inhaled for a few minutes it usually heightened, in some degree, the colour of the face, and surface-temperature, the difficulty of inducing the patients to continue the experiment for a sufficient length of time, owing to its interference with respiration, and the increased thirst which it occasioned, caused it to be abandoned.

Oxygen.—Inhalation of oxygen, by means of Dr. Richardson's apparatus, was also made trial of. In one case, that of a woman in collapse, the pulse became perceptible for a few minutes.

A woman, aged forty-four, in collapse, inhaled oxygen for eighteen minutes, the pulse, previously all but imperceptible, increased in strength, and the temperature of the surface was slightly elevated.

In a third case, that of a girl, aged twenty-four, oxygen was administered on three several occasions; the temperature rose slightly after the first administration, and the patient requested that she might have it again, " as it gave her relief."

The oxygen, like the amyl, though of temporary advantage, was found to produce no permanent benefit, and was therefore discontinued.

State of the Blood.—In connexion with the pathology of cholera a full and accurate knowledge of the state of the blood has been much desired, and is still wanting. We believe that not only is the blood the primary seat of the choleraic agent, but that, to the physical and chemical changes wrought in it by the operation of that agent, and the consequent depravation of its vital or nutritive properties, are due the prominent symptoms and fatal tendency of cholera.

Mr. Sedgwick denies the existence of a specific morbid poison in the blood in cholera, and refers all the phenomena of that disease to functional derangement of the centres of the sympathetic system, excited through the medium of the stomach.

No doubt the stomach is functionally deranged, but the derangement may, with as much show of reason, be referred to cerebral irritation as to sympathetic; and even more plausibly, because there is, almost invariably, engorgement of the cerebral vessels, whilst congestion of the sympathetic ganglia has not been observed in cholera. No doubt Delpech[a] declares that he has found traces of inflammation in the semilunar ganglia of persons who had died of cholera; but Cruveilhier[b] has not met with this or any other organic change in these bodies, or in the solar plexus emanating from them.

[a] Etudes du Cholera Morbus en Engleterre et en Ecosse. Paris, 1382. 8vo.
[b] 14° Livraison.

In the *post mortem* examinations of cholera which we have made we have likewise failed to find congestion or other alteration of the abdominal sympathetic system.

The doctrine of "derangement of the ganglionic system of nerves," to which vascular engorgement and arrest of secretion in cholera have been attributed, is therefore unsupported by facts; whilst the blood-doctrine has in its favour the admitted fact of chemical alterations in that fluid, which, by impairing or annihilating its nutritive affinities for the vessels and tissues through which it circulates, would account for the arrest of pulmonary and general circulation, and of glandular secretion.

Dr. Parkes[a] says :—"It will be seen that the leading idea I have formed of the nature of cholera is, not only that it is primarily a disease of the blood, as has been so frequently surmised, but that the changes induced in the function of respiration, directly consequent on the alteration of the blood, are the proper and distinctive symptoms of the disease."

"That there is some impediment or arrest of the circulation in the capillary system generally, and in the pulmonary capillaries in particular, appears almost certain; and it is by no means improbable, from the whole bearing of the facts, that this is due to a chemical change in the fibrin, and in its mode of combination, consequent on the direct agency of the active cause."

He has found the blood, in the majority of cases, uncoagulable, and its colour dark.

The blood in the collapse stage of cholera, as is well known, is dark and viscid—the latter quality being so decided as to render it difficult to obtain even a small quantity of blood by venesection. In one instance we succeeded in obtaining an ounce and a half with great difficulty a few hours before death. In another, on making a puncture in the vein, a large drop of dark tarry blood welled up, and effectually blocked the opening, remaining fixed to the wound; no more blood could be drawn. The blood of the former patient, examined microscopically, exhibited the red corpuscles *dwarfed and crenated.*

Some blood obtained by cupping from the loins of a man in the consecutive fever, twenty-four hours before his death, showed the red corpuscles of normal size and shape, but aggregated in *rouleaux.* In one instance we tested the reaction of the blood, and

[a] *Opus citat,* pages 4 and 112.

found it alkaline, contrary to the experience of Dr. Marcus at Moscow.[a]

Dr. R. D. Thompson[b] has analysed the blood in cholera, and found the water diminished, whilst the solids were all in excess of the normal proportion. Thus—

SYNOPSIS OF DR. THOMPSON'S EXPERIMENTS.

	In Cholera.		In Health (Lecanu.)
Water	717·8	...	790·00
Fibrin	4·5	...	2·95
Globules and albumen ...	268·8	...	199·55
Insoluble salts	1·8	...	1.00
Soluble salts	7·1	...	6·50
	1000·0		1000·00

Schmidt[c] has found a deficiency of water, salts and fibrin, and has observed the loss of these constituents of the blood by transudation into the alimentary canal, to occur in the order in which they have been just mentioned. He likewise found the blood corpuscles considerably altered, both physically and chemically, mainly by loss of water and chloride of potassium, and a reduction, by one-half, of the amount of oxygen normally contained in them.

Pathology.—The *post mortem* appearances in the bodies examined by us (four in number), were nearly identical with those observed by Parkes[d] and Munro,[e] and likewise described and illustrated by Cruveilhier[f] and Craigie.[g]

The autopsies were made from five to six hours after death. The *rigor mortis* was absent, and the bodies were much less livid than in the last hours of life.

Cranium.—The sinuses of the dura mater and the cerebral veins were engorged with dark blood. The pia mater investing the brain generally, but more especially at the base, was congested. The choroid plexus was remarkably congested, and of a slate colour.

On making a horizontal section of the cerebral hemispheres the

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[a] Aitken's Science and Practice of Medicine, Vol. i., p. 634.

[b] Chemical Researches on the Nature and Cause of Cholera, Medico-Chirurg. Transactions, Vol. xxxiii.

[c] Aitken's Science and Practice of Medicine, Vol. i., p. 632.

[d] *Opus citat.*   [e] *Opus citat.*

[f] *Opus citat.* Pl. 1, 2, 3, 4, and 5.

[g] Edinburgh Med. Journal, Vol. xxxix.

puncta cruenta were observed to be large and numerous, and from each welled up dark liquid blood, which, in a few seconds, formed a patch of ecchymosis. The cerebral ventricles contained a good deal of clear serum—in one instance they were distended with it. The membranes of the upper portion of the spinal cord were similarly congested, but its white substance and grey centre were free from vascularity.

Thorax.—The lungs were somewhat congested posteriorly, but still resonant on percussion, and crepitant. In the infero-posterior portion of one lung there was much dark blood, mixed with serum. The anterior portions of the lungs were of a light colour, and free from congestion. The right cavities of the heart were full of dark, tar-like blood, which, in the right ventricle, was enveloped in a capsule of fibrin one-eighth of an inch thick, and extending into the pulmonary artery. The left chambers were empty and contracted; the left ventricle much diminished in capacity, firm and thickened, manifestly by strong contraction of its walls.

Abdomen.—The peritoneal surface of the hollow viscera was smooth, white, and glistening, as in a state of health. Liver, spleen, and kidneys normal. Mesenteric glands all more or less enlarged—some of the size of peas. The semilunar ganglia, solar plexus, and splanchnic nerves presented a natural appearance, and were free from congestion. The stomach contained a quantity of gruel-like fluid. The mucous lining of the œsophagus projected into the stomach, forming a radiated disc, with a festooned border of a pale colour, and sodden-looking, and presenting the appearance of a piece of wet parchment (Fig. 1). In the immediate neigh-

bourhood of the cardiac orifice the mucous membrane of the stomach was remarkably mammillated, the crypts being distended with an opaque white liquid (Fig. 1). Both the small and large
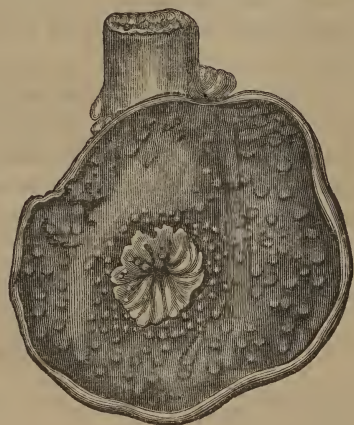
Fig 2.
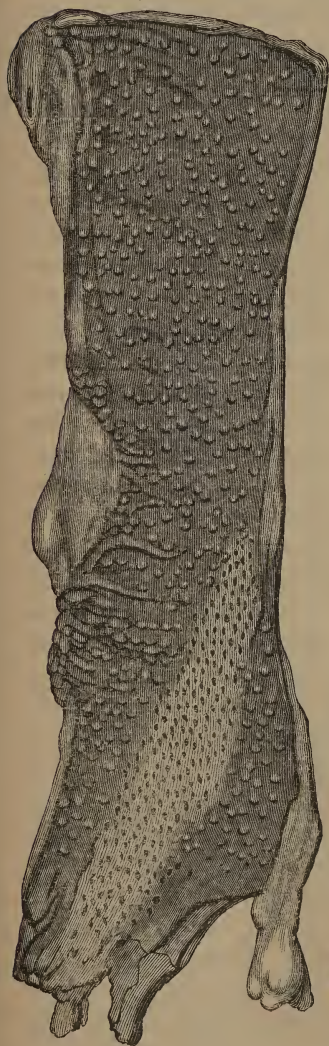
Fig 3.

intestine were nearly filled with a liquid of the colour and consistence of thin boiled starch, in which small white flakes were suspended. Brunner's glands were enlarged, and of a light colour. In the jejunum and ileum the glands, both solitary and agminate, were enlarged and filled to distension with an opaque fluid resembling unhealthy pus (Figs. 2 and 3). The mucous surface generally was vascular in the jejunum and upper portion of the ileum. The lower portion of the ileum was free from vascularity; the solitary glands were here remarkably distinct, and one of Peyer's patches was found to have discharged its contents, all its glandules being ruptured and collapsed, and each presenting a distinct aperture on the surface, by which the contents had escaped (Fig. 2). The entire surface of this patch, which measured about three inches in length, was depressed below, and contrasted markedly with the surrounding surface, on which the solitary glands were prominent and distended (Fig. 2). The liquid contents of one of these glandules, examined microscopically, were found to contain large granule cells like mucous-corpuscles, and amorphous granular matter. The enlarged solitary glands extended quite to the ileo-cecal valve In the ascending colon some slight vascularity was apparent. The above description applies in all essential particulars to the three bodies in which the stomach and intestinal canal were carefully examined; the correspondence in regard to the state of the intestinal glands in these three bodies being especially remarkable.

The larynx of a woman who was admitted in collapse, with total loss of voice, and died, two hours afterwards was examined, the true vocal chords were thickened, their sharp angles rounded off, and the ventricles of the larynx diminished in capacity by thickening of the mucous membrane. There was, however, no abnormal vascularity.

The state of the intestinal glands demand special observation; Dr. Parkes, who, in his work on cholera, notices this state, regards it as a consequence of the diarrhea. We cannot coincide in this opinion, being aware that in other diseases complicated with intestinal lesion, diarrhea is a frequent consequence, though rarely if ever a cause of glandular enlargement. Moreover, in the neighbourhood of these glands there was no appearance of irritation or abnormal vascularity, such as Dr. Parkes' view of the pathology of their enlargement would necessarily imply. Our firm conviction is, that the engagement of these organs, their distention with a fluid of an apparently specific character, and subsequent discharge of it by rupture of their walls, as exemplified

in a few of the patches of Peyer, is, like the diarrhea, *eliminative* in character and purpose, and to be regarded as evidence of the presence of a specific morbid poison in the blood. Further evidence of this is furnished, as we believe, by the peculiar roseolar eruption previously noticed under the name of *rubeola cholerica*.

We are indebted to Mr. Oldham, of Rathgar, for the beautiful woodcuts annexed, which he has engraved from the original drawings of the late Mr. Connolly, whose recent death inflicts a loss upon the medical profession in Dublin which it will not be easy to repair.

It is our firm conviction that cholera, although when advanced to the stage of collapse, an appallingly fatal disease, is, nevertheless, *preventible* in the strictest sense; and *eminently curable* in the stages preceding collapse. Of the truth of the latter assertion a direct confirmation will be found in Table 3 A of this report.

As regards preventility, very important evidence has been recently furnished by the Registrar-General of England, showing the effect upon the mortality of cholera, of well-devised and well-executed sanitary measures. It appears from his returns, that the death-rates per 10,000 of the population in England and Wales, during the three last epidemics, have been as follows, viz. :—

$$1849 \quad . \quad . \quad . \quad 62$$
$$1854 \quad . \quad . \quad . \quad 43$$
$$1866 \quad . \quad . \quad . \quad 18$$

Per 10,000 of population.

M. Dumas[a] stated at a recent meeting of the Academy of Sciences, Paris, that during the cholera-epidemic of 1865, not one of the women employed in washing the linen of the Paris hospitals (*which was always, in cholera cases, disinfected as soon as brought from the wards*), fell a victim to cholera. Moreover, only one of the employés of the *Administration des Pompes Funèbres*, amounting to nearly 1,100 persons, died from cholera; *the Administration having rigidly insisted on the observance of the requisite hygienic precautions.*

Dr. W. Budd, in a carefully compiled and able report on the recent epidemic of cholera at Bristol, illustrated by maps, shows, in a striking manner, the efficacy of sanitary measures and prompt disinfection He says:—" A comparison of the numbers swept off by

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[a] Medical Times and Gazette, Feb., 1867.

cholera and diarrhea in Bristol (including Bedminster and Clifton, which, with Bristol, are practically but one town) in the four successive outbreaks of 1832, 1849, 1854, and 1866, will be the best introduction to what is to follow. These numbers are, respectively, 1832, 626; 1849, 1,979; 1854, 430; 1866, 29. From these figures it will be seen that the deaths which, from something below a thousand in 1832, had risen to nearly 2,000 in 1849, fell to 430 in 1854. This great drop, in exact accordance as it was with the corresponding abatement of the mortality from the pest in other cities, was at the time, and no doubt rightly, ascribed to the sanitary improvements which had taken place in the city in the interval between the two epidemics, and especially to the construction of a better system of sewers, and the introduction of a pure supply of water."

" But the fall from 1854 to 1866 is much more remarkable. For while the deaths in 1854 amounted to about one-fifth of those of 1849, the deaths of 1866 were one-fifteenth only of those of the former year. Part of this result might, no doubt, be reasonably ascribed to progressive sanitary improvement, but the very abruptness of the contrast between the mortality of the two years naturally suggests to the mind the intervention of some new controlling condition."

" As a matter of fact such a condition did exist in the shape of the vigorous employment of the disinfecting plan. An analysis of the facts will leave no doubt, I think, in any reasonable mind, of the reality, while it alone can give an exact measure of the extent of the operation of this plan in preventing the spread of the disease."

Doctor Mapother, in his recent work on Public Health,[a] declares that " he is convinced, from a comparison of the last with the previous epidemics, that cholera will be a more frequent visitor, and our safety lies in sanitary work, which will, with positive certainty, render its attacks less formidable."

In this statement we quite concur ; and we feel satisfied that if the air breathed, the water drunk, and the food taken, be of a wholesome character, individuals and communities so circumstanced will suffer comparatively little from cholera epidemics.

Of the air and the water consumed by a population, the public authorities of the place are the legitimate and responsible custodians, and no remissness of action in regard to these essentials to public

[a] Opul. citat., Feb., 1867, page 453.

health should be permitted upon their part. They are now armed with sufficient power, under the law, to enforce the observance of sanitary precautions, not only in thoroughfares, but likewise in private residences, and if they do not use them to good purpose, they should be held to strict account by those whose interests are thus intrusted to their care.

Every enlightened man in a community, as it seems to us (and more especially, every physician, who understands this question in all its bearings), should be *a sanitary public officer*, to the extent of co-operating, to the utmost of his power, with the persons deputed by law to supervise the public health.

It is notorious that in the successive epidemics of cholera, the disease has visited and desolated the same streets, and the same houses, where, in the intervals, sanitary improvements have been neglected.

The address of every house in this city in which a case of cholera occurred during the recent epidemic, and a record of the number of cases in each house, is in the possession of the dispensary and hospital physicians who had charge of these cases.

We would venture to suggest that this mass of local information be utilised for the construction of a system of house-to-house visitation, which, we believe, if fully and conscientiously carried out, would effect the utmost that is possible towards the prevention of cholera in the future.

In conclusion, we beg to subjoin a brief summary of the principal conclusions which we think are fairly deducible from the foregoing report :—

1. The diarrhea so prevalent amongst the inhabitants of localities actually suffering from cholera, is a premonition, and the earliest manifestation of cholera.

2. Cholera is a disease strictly preventible by sanitary and hygienic measures, and, in nearly all cases, curable in the stages preceding actual collapse.

3. The treatment which we have found most successful in the stage of choleraic diarrhea is sulphuric acid and opium ; with sinapisms, external heat, and creasote water.

4. In collapse we have had more success with calomel given in large doses, than with any other medicinal agent. In several cases, besides those in which recovery took place, reaction set in under the calomel treatment, but death occurred in the consecutive fever.

5. We believe cholera to be contagious, but in a much less degree than the principal endemic contagious diseases of this country, viz., typhus, scarlatina, measles, and small-pox.

6. As regards individuals exposed to the contagion of cholera, a state of good health, with sanitary and dietetic precautions, afford a strong assurance of immunity from attack.

7. *Immediate* attention should be given to derangement of stomach, or laxity of bowels, during a cholera epidemic; and to insure this amongst the poor, house-to-house visitation seems indispensable.

Art XXII.—*Cases of Fever, with Cerebro-spinal Meningitis, with Remarks.* By Samuel Gordon, M.B., Fellow and Censor of the College of Physicians; Physician to the Richmond, Whitworth, and Hardwicke Hospitals; Lecturer on the Practice of Medicine, Carmichael School of Medicine, &c.

Since the year 1846, when the late Dr. Mayne published in this Journal his " Remarks upon Cerebro-spinal Arachnitis," and Dr. Darby "submitted his detailed account" of the same disease to the Surgical Society, we have seldom been for any long time without witnessing sporadic cases of that formidable affection in this city, either in hospital practice or in private.

It sometimes occurred as the primary disease, at other times it came on as sequela of typhus, or of the exanthematous fevers. In the late epidemic of cholera it often attacked convalescent patients, four such were simultaneously attacked with it in the Hardwicke Hospital; and while it usually presented many formidable symptoms which rendered the diagnosis sufficiently plain, medical treatment early adopted and energetically followed up saved the lives of many. Within the last year the same disease has again assumed the character of an epidemic, and by the rapidity of its progress in many cases, and the obscurity of its symptoms, has caused great alarm; the occurrence of some new phenomena may, perhaps, render it advisable to record a few of the more recent cases.

Amongst the first which I believe occurred in this city of the epidemic, in what I will term its new form, was the following, admitted into one of my wards in the Hardwicke Hospital, on April 5, 1866; and, contrary to what usually happens in the earliest cases

of a new formidable epidemic, the patient recovered. Bridget Fox, aged eighteen, was attacked. on the 2nd April, with severe pain in her head and back, and pains in all her bones, with shivering. She remained in bed all the 3rd, but could not get warm. On the 4th the pains were so great that she could not move. She vomited frequently thin greenish matter, and was also frequently purged. On the 3rd she observed some blue spots coming out on her legs, which gradually increased in size, and when she came into hospital both the upper extremities and the right lower extremity were thickly covered with dark blue spots—some small, others very large.

In some the cuticle was raised, and very dark serum effused beneath it. Some consisted evidently of large extravasations of blood, as seen in purpura, while others were distinctly effusions into the cuticle, and so raised prominently above the surface. Besides these the entire body was extensively covered with large ecchymosed spots, like bruises. The constitutional symptoms were very severe— alternating delirium and coma, slow respiration, quick pulse, temperature 103 ; great soreness of the surface in general, with severe pains on motion. This girl blamed for her illness the emanations from an open cess-pool near the house where she lived. She made a good recovery, but many of the spots passed into superficial gangrene, and healed with loss of substance ; in the remainder the effused blood was gradually absorbed, but discoloration was long observable, and there still (April 5, 1867) exist deep depressions where the gangrenous action had existed.

This case is not selected as a notable example of the epidemic, but because it was the first which came under my own cognizance of the combination of the peculiar eruption with symptoms of cerebro-spinal irritation.

CASE II.—W. J. S., ten and a half years of age, a pupil in a large public school, appeared to be in perfect health on the morning of the 3rd of March. He took his usual part in singing in the choir in church, but was observed to be unusually drowsy. After church he walked into the play ground, but complained of cold and weakness, and on passing into the dining-hall he vomited ; he then (it was now two o'clock) walked up between two other boys into the infirmary. He was now cold and shivering ; the infirmary nurse said he had the look and smell of death on him. He was rapidly undressed, and put into a hot bed, and external heat and counter-irritation largely applied. In about twenty minutes re-aniamtion was

partly restored; he now complained of intense pain in the head, vomited black, coffee-coloured fluid, and afterwards some yellow bilious matter. The apothecary of the institution saw him about half-past two o'clock; a turpentine enema was administered, and he had some cordial diffusible stimulant, and the external heat and counter-irritation were kept up. I saw him about five o'clock, he was then rapidly becoming comatose; his pupils were slightly dilated, insensible to light; he was quite deaf; the temperature of the body was rapidly failing. He was bedewed with cold, clammy perspiration; his body, more particularly the lower extremities, was covered with a dark purplish eruption, which the nurse said rapidly came out on him after he was put to bed. This eruption consisted of spots of various sizes and shapes. He had no muscular rigidity of any part of the body. His bowels had been moved, and he had passed urine, both unconsciously. His respiration was nine in the minute; his pulse 120; he had not spoken since he came into the infirmary except to complain of his head. I directed his head to be shaved, strong counter irritation to be applied to the scalp and upper part of the spine; the diffusible stimuli to be continued. He gradually passed into a state of complete somnolence, and he was dead at a quarter past six o'clock.

The entire duration of his illness was under five hours. An accurate *post mortem* examination of the entire body was made. The arachnoid membrane over the upper surface of the brain was all more or less opaque, and in some spots presented a greenish hue, which was owing to the existence of a layer of very thin purulent matter beneath it. This condition existed chiefly over the lateral portions and along the top of the fissures; there was some turbid serum in the ventricles, and a large quantity at the base of the brain also discoloured. Cerebral pia mater was excessively vascular, and this condition extended also along the entire spinal cord. The arachnoid membrane at the base of the brain was comparatively healthy. The blood was everywhere very fluid; the right side of the heart was gorged, and the lungs remarkably congested.

The mode of this patient's death throws great light upon the nature of the disease—he evidently died asphyxiated—the respiration had rapidly come down to nine in the minute, while the pulse was 120. The large quantity of serum which was rapidly effused into the upper part of the spinal canal, had produced mechanically a direct paralysis of the muscles of respiration, and the profound and fatal coma was induced partly by the mechanical pressure

on the great nervous centres, but still more so by the depressing influence of the unaerated and highly carbonized blood, which was circulating through the brain. The diseased condition of the blood must not be overlooked; it formed an important element in the case, giving rise by its remarkable fluidity to the cutaneous eruption, and to the congestions which were everywhere manifest.

CASE III.—E. C., aged fifteen, a pupil in the same school, came to the infirmary on the morning of March 11, complaining of severe pains in his hips and groins; his pulse was natural—his respiration quiet—his bowels free—urine copious—no pain on pressure along the spine nor over the seat of pain. He was ordered to remain in bed, to have some diaphoretic mixture, and a warm hip bath in the evening. He took but little food throughout the day; but had no rigor nor other accession of illness. He woke suddenly in the middle of the night, delirious, began to hum tunes, to fancy that different people were conversing with him, and continued for hours in a more or less excited state; towards morning he vomited, had slight diarrhea, and then became quiet, but gradually became listless and stupid. I saw him very early in the morning; he swallowed very freely, but showed scarcely any other sign of intelligence; his pupils were fixed, insensible to light, and he had slight strabismus; he had no rigidity of any part of the body, nor did he evince any sign of pain on pressure; he passed urine and feces involuntarily; some few spots like stains, or the *taches bleautres* seen in typhus fever, came out over the surface of the body, particularly over the lower part of the chest and the abdomen; his pulse was 120, very small; his breathing slow and oppressed; the surface of the body could, with difficulty, be kept warm. All possible means were used to recover him from this collapsing state. I had the advantage of Professor Banks' and Dr. Croker's assistance, and he continued to live until midnight. *Post mortem* examination fifteen hours after death found some serum at the base of the brain. The arachnoid membrane on its surface was slightly opaque in spots, and there was some subarachnoid effusion of discoloured serum, but no lymph or purulent matter; there was effusion into the ventricles of the same nature, with excessive vascularity of the choroid plexus, and of the entire pia mater, both cerebral and spinal.

The right side of the heart was gorged with blood, the lungs excessively congested; the blood everywhere remarkably fluid.

It may be considered that in this case the *post mortem* appear-

ances were insufficient to account for death, or to connect the death with cerebro-spinal disease as cause and effect; but, firstly, it is to be remembered that many of what are termed blood diseases cause death before their specific characteristics have time to become developed; we often find it so in an analogous disease—typhus fever; and such is well known to be the case in cholera. When the cholera reached Muscat (says Dr. Williams), in some instances only ten minutes elapsed from the first seizure before life was extinct, long before any characteristic morbid appearance could be developed, at least in the solid organs of the body.

There was, perhaps, some difference in the mode of death in the two cases. The first was clearly asphyxiated, the second died from the shock of the disease, and from the rapid supervention of cerebro-spinal congestion. We cannot ascertain what amount of effusion or congestion is sufficient to produce symptoms of compression; this will depend on the rapidity with which such effusion is poured out, and the resistance which the nervous centres are capable of making, rather than on the quantity of the fluid. But in these two cases we had, for a few hours, symptoms of a profound nervous prostration, with obvious marks of blood disease; the latter continued after death, and the former are shown to have coexisted with an effusion of discoloured serum into and beneath the arachnoid membrane in one case, and with other marks of incipient disease of the same part in the other.

Cases II. and III. are examples of this malignant epidemic proving fatal in the very early stage, before any organic affection of the nervous centres had time to be fully developed. Case II. is, I believe, the most rapidly fatal on record.

The following case is a peculiarly well-marked example of the epidemic cerebro-spinal meningitis, in which a purulent membranous inflammation co-existed with evidences of extensive blood disease.

Case IV.—Catherine Murphy, aged fifteen, of no occupation, residing in Corn Market, was admitted into the Hardwicke Hospital on the 26th of February. She gave the following account of her illness:—On the 23rd she did not feel quite herself, and thought she was about to menstruate, which she had not done for two months. In the evening, three spots, like hives, appeared on her forehead. On the following day, Sunday, she also felt ill, but not so much so as to prevent her being up. At about six o'clock in the evening she shivered, and soon afterwards went to chapel, where,

while kneeling, she fainted. She was afterwards able to walk home, very much frightened, and went to bed. At about two o'clock a.m., she vomited, and was very restless the whole night; did not sleep at all, and felt sore in all her bones. On the 25th the pains in the extremities increased, and she felt very weak; did not sleep at night, and on Tuesday morning felt very much worse. Then, for the first time, her friends perceived that there were dark spots on her limbs. She came to hospital on Tuesday evening at half-past five o'clock.

On admission she could answer questions distinctly, and gave a tolerably intelligible account of her illness; however, her manner was strange, and when left to herself, she wandered. On her extremities there were numerous spots of different sizes, generally about a quarter of an inch in diameter; on her knees there were some larger, and on the back of her left shoulder was one irregular blotch measuring an inch across. Their colour was a brownish red, in the centre there being a whitish spot, and around each blotch there was a rim of lighter red; both the whitish central part and the red areola followed pretty accurately the same outline as the dusky part. They were all raised above the skin so as to feel like a weal. She lay on her chest and abdomen, and refused to lie on her back; but her head was not retracted, nor did she complain of pain on pressure along the spine. She attributed the "stiffness" of her back to the fact of her "lying for two days." She said the only discomfort she suffered was a pain in the head and a soreness of her bones. Tongue white. Pulse ninety, not very weak.

27th.—Has not slept since her admission. She talked incessantly all night, extremely restless, could scarcely be kept in bed. She lay on her abdomen, and refused to allow herself to be moved on her back, or on either side. Her spine presented a most wonderful and uniform curve concave backwards; her head was now also curved backwards on the spine of the neck. I never saw so much opisthotonos in the worst case of tetanus. She had no pain or tenderness on pressure on any point of the spine.

The form of her delirium was very peculiar; she would answer any questions most accurately, however long the answer required might be; but the moment she was left to herself, she at once began to wander, and to talk the most unconnected and foolish sentences, and to imagine that various friends were around her, and speaking to her.

28th.—Head not much retracted; dysphagia very well marked;

in a much greater degree than can be accounted for by her very abnormal position; intense vascularity of the conjunctivæ; peering expression of eyes, pupils fixed, semidilated; headache gone; pains down the limbs continue; she talks incessantly, but quite unconnectedly; not so easy to make her answer questions. P. 104. Temp. 99. Tongue cleaner.

Towards evening she became very much flushed, and perspired profusely. Some fresh spots, black as ink, appeared on her elbows and feet; a mixed eruption—a few spots of bullæ, which rapidly became opaque and dusky, several patches of herpes, which rapidly became flattened and dark coloured—one or two of the original dark coloured spots near the knees are rapidly passing into gangrene.

March 1st.—Pulse 140; she is gradually lapsing into a state of unconsciousness, taking no notice of questions, but keeping up a low muttering delirium; herpetic eruption on lower extremities increased; she died at one o'clock a.m. on the 2nd.

The body, after death, presented a very frightful appearance. It was still prominently arched forward. It was of a dusky blue colour, and with a copious eruption of black spots, of various sizes, from that of a small pea to a crown piece; some small and circular, others large and irregular in form. One or two of those near the knee had taken on a gangrenous action, and appeared to have been rapidly spreading; several of the smaller spots were effusions into the layers of the skin, very prominent, hard, black, and circumscribed, like the minute spots of apoplexy in the lung. There were, moreover, various patches of herpetic eruption on different parts of the body, and several bullæ containing dark coloured serum. The brain and spinal cord presented all the appearances of intense purulent arachnitis. When an opening was made into the lower part of the theca vertebralis, purulent matter flowed out; and on slitting it up, and allowing all the fluid pus to escape, the entire surface of the pia mater, anteriorly and posteriorly, was covered with a coating of thin purulent matter, which, like a thin layer of butter, remained adherent to it. When this was wiped off, the vessels of the pia mater were found gorged with blood. These appearances extended up along the entire spinal membranes; the extreme vascularity of the pia mater was continuous over the brain, but not so the purulent effusion, which existed in patches only over the convex surface of the brain, and was not continuous. The cerebral arachnoid was all opaque, and the lateral ventricles contained an undue

quantity of turbid serum. The blood in all the cavities was very fluid and dark-coloured; the lungs were immensely congested.

The following case is an example of the disease assuming a somewhat chronic form, and remarkable also for the complications which arose during its progress—paralysis affecting various parts; peculiar form of ocular disease, and inflammation of the knee-joint.

CASE V.—Owen Dermody, aged twenty-one, a grocer's assistant, was admitted into the Hardwicke Hospital, March 3rd, 1867, complaining of intense headache and weakness. About eight o'clock p.m. on the previous evening, while attending in the shop, he complained of being cold and chilly, but continued at his work till 11.30 p.m. While in bed, at about two o'clock p.m., he suddenly got very ill and became quite confused in his mind. In the morning his medical attendant advised him to be removed to hospital, and he was admitted at 12·30 p.m. He was then in a very prostrate condition, his face very pale, an eruption of herpes on his nose, pulse weak and quick, tongue dirty, cannot look at the light, abdomen soft, bowels confined.

4th.—Slept badly last night; vomited frequently yesterday a yellowish fluid; headache still continues.

5th.—Headache not much relieved; raved during the night; herpetic eruption on the nose and upper lip, and still spreading. The patient is constantly wanting to get out of bed. Pulse very weak.

6th.—Rather violent last night, and got out of bed several times. To-day a peculiar eruption appears, of several blueish-black spots, irregular in shape, on the chest, abdomen, neck, arms, legs, and feet. Two spots, one on the dorsum of each foot, are particularly remarkable for their size and colour. The right eye is a little inflamed with a slight discharge from it. The herpetic eruption is over his nose and lips, but has a horrible appearance, being perfectly flat, and becoming black.

7th.—Patient's head is drawn backwards toward the right side; he has great pain in the neck with general hyperesthesia. The eruption has increased since yesterday. His mind is getting more confused.

8th.—He is quite powerless, cannot raise his arms or legs; when spoken to, he answers questions perfectly; but when left to himself, he talks incoherently. The lower third of the cornea is ulcerated, with great vascularity of the conjunctiva. A large bulla has

formed on the instep of the left foot.   The urine is drawn off with a catheter.

9th.—The patient has not slept since six o'clock yesterday evening; he seems to suffer great pain.   There is a discharge from the right eye.   The lower half of the cornea is quite opaque, the conjunctiva very vascular, the iris discoloured, and the pupil irregular.

At the commencement of the attack this man got a small quantity of wine, and external heat was sedulously kept up; immediately he had recovered from the collapse, he was leeched behind the ears, his head was shaved, and cold applied; and he had large doses of chlorate of potass and muriate of quina.   His head was now blistered, mercurial ointment rubbed in, and he was ordered a grain of extract of balladonna, and three grains of sulphate of quina every second hour, and the wine was resumed in small quantity.

10th.—The patient has not slept since the 8th, nor has he any appearance of sleepiness; pulse 120; pupils dilated; intelligence less clear; tongue red and dry; subsultus and general tremors; bowels confined; the eruption has faded a good deal; two more large bullæ on the right foot.   To have a pill every three hours, a blister to the back of the neck, and afterwards mercurial ointment.

11th.—Pulse 136.   Patient has not slept yet; he is greatly reduced; the subsultus still continues, to which is added floccitatio; increased vascularity of conjunctivæ; no improvement in the condition of the right eye; spots fading; still the lips have a better colour; continue pills and wine.

12th.—At nine o'clock last night the patient passed a large, dark-green motion from his bowels; urine scanty.   About this time he began to vomit a greenish fluid, which he continued to do during the night in small quantity.   He is greatly troubled with hiccough.   The pupils are widely dilated.   He has not slept since the evening of the 8th, and is very much exhausted.   He was now given ten drops of tincture of opium, with one teaspoonful of brandy in one tablespoonful of iced water every hour.   He also got ʒss. of tr. opii in an injection, which was followed by a motion from his bowels in fifteen minutes.   Pulse 140.   At 10·30 p.m., when he had altogether taken about two drachms of laudanum, the vomiting stopped, and he gradually fell asleep   He slept all through the night.   The pupils contracted under the influence of the opium.   Head drawn backwards to right side.

13th.—Looks much better; pulse 120; tongue red, its sides covered with aphthæ.   Intelligence better; can draw up his legs in

bed; seems to have most power of left side; right side of face paralysed of motion. He takes a drachm of tincture of quina, a drachm of solution of bismuth, with one teaspoonful of brandy every three hours; a weak solution of liquor ammoniæ acetatis was kept applied to the right eye; catheter still required. Four o'clock p.m.—Asleep, and slept all through the day. Head drawn to the right.

14th.—Pulse 120; temperature in axilla 97⅘; tongue rough and very red; intelligence much better; passes urine. Evening, Temperature 100¾.

15th.—Pulse 112; temperature in axilla 99⅔; tongue moist and clean. He seems much better to-day. His head is quite straight, and he has more power in his limbs. The urine contains a large amount of phosphates. Drinks well; eat two small biscuits last night and again this morning. Eruption gone. There is a purple tinge down the outside of his arms. Eye better. Low diet—arrow root, wine 8 oz., brandy 4 oz.

16th.—Pulse 112; urine clear; normal in quantity; appetite improving. Temperature rose and fell several times during the day.

17th.—Pulse 120; tongue moist and clean; patient complains this morning of an intense pain in the right knee, which attacked him suddenly. The eye is much better; pupil natural. Appetite good. Bowels moved once this morning, is passing plenty of urine. His back is inclined to strip. There is immense effusion into the right knee-joint, but no redness. Heart perfectly healthy. Large opiate poultices to knee.

18th.—Pulse 100. The patient slept very well last night, and is much better this morning; he does not complain of any pain except when the knee is moved. Tongue clean; appetite good. Urine sp. gr. 1020; no albumen. The conjunctiva of the right eye is still vascular, and the cornea ulcerated. Vesicating collodion to be applied to the knee.

19th.—Pulse 112. The knee is not so tense, and is much less painful on motion. Expression of face heavy; does not answer questions so readily. Paralysis of the muscles of the right side of the face continues. Cannot move his head freely. To have bark-mixture with iodide of potassium.

20th.—Pulse 112; the patient complains only of pain in the right knee. Eye much better. Facial paralysis very slight.

21st.—Tongue clean; appetite very good; sleeps well; back which was a little stript, is almost well.

22nd.—The patient, after sleeping for some time, awoke complaining of headache, and in a short time his nose began to bleed a little, the blood coming from the left nostril. This relieved the headache.

23rd.—Patient improving every day. Does not complain of any pain. Appetite good. Tongue clean. He has steadily continued the bark mixture. Wine and light nutriment.

24th.—Pulse 112. The knee does not give the patient any pain except when he attempts to move. · His neck and back are still stiff, he cannot move his head freely from side to side. Heart perfectly healthy, and respiratory murmur over chest healthy. Eye much better.

This man recovered from all the acute symptoms, but has gradually passed into a state of almost organic life ; he eats, drinks, and sleeps well; he passes solid feces and urine without giving any notice, yet, evidently, not unconsciously ; he is excessively emaciated, and their is a peculiar mouse-like smell from him; he seems to understand what is said to him, but he cannot answer; he never calls for anything ; his breathing is rather slow ; his pulse, 120 ; his heart acting with a peculiar strong jerking motion ; his eye is quite well, as also his knee ; he can draw his legs and arms up to him; but he cannot use his hands at all. Such is his condition to-day, April 29.

The above cases I have detailed as typical of the various forms in which the disease has presented itself. I could add many more. Thirty cases, at least, of this disease have been admitted into the Hardwicke hospital since April, 1866, and I have seen others in private practice.

Without detailing these at length I shall make use of them to exemplify the following remarks on this formidable epidemic.

The first question to be considered is whether the present is a new epidemic, requiring a new name, or whether it has been already described. If the latter be the case, those who have precipitately attached to it a pseudonym, calculated equally to alarm the public and misguide the profession, have, at least, acted with imprudence ; but, as is well observed by an American author,[a] writing on this very subject, "it is worthy of remark that whenever a malady assumes any unusual form or presents anomalous symptoms, there is always too ready a disposition to accept the novelty of it. It is

[a] See Dr. Baltzell on Epidemic Typhus.—American Journal of Medical Science, October, 1865.

always an easier task to describe a disease than to analyse its symptoms; and the ready acceptance of a new medical theory involves less trouble, if not quite so much satisfaction, as the proof of it."

There appears to me to be no occasion to look upon it as a new disease. It was unfortunately too well known in other countries, and is well described by French, German, and American authors, who have all had vast experience of it. The cases of cerebro-spinal meningitis, which have been seen during the present epidemic may be subdivided as follows :—

1st. Cases which were characterized by the suddenness and gravity of the symptoms: usually more or less lesions of innervation and extensive dark-coloured eruption, accompanied by copious sub-arachnoid effusion, cerebral and spinal, and of various kinds.

2nd. Cases almost, or altogether, as grave, indicated by very much the same set of symptoms, in which scarce any cerebral or spinal effusion was found, but always great congestion.

3rd. Cases analogous to those of cerebro-spinal meningitis sporadically met with where the symptoms of spinal irritation were well marked, and where lymph, or pus, or both were more or less copiously effused.

In some cases as IV. and V., a copious eruption was developed; in others, as in No. III., while there was no well-marked eruption there were other distinct evidences of decomposition of the blood and of disease of the nervous centres.

But all these varieties had, in common, some symptoms of the sudden invasion of a morbid poison, which had for its two great characteristics a diseased condition of the blood and a profound nervous lesion. We are thus led to conclude that the disease is an adynamic typhus, the result of a specific poison, having a peculiar affinity for the cerebro-spinal system. Why it should have this peculiar affinity we are not yet in a position to explain, any more than we account for why the poison of enteric fever should expend itself on the glands of the small intestines.

The fact that in those patients who survive the stage of invasion an inflammation of the spinal membranes is developed, proves that the essential nature of this epidemic consists in a cerebro-spinal affection, but the diseased condition of the blood, which always exists, attests the low type of that affection, in the same way that the congestive pneumonias, and other visceral congestions, are, more

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or less, a part of our ordinary maculated typhus fevers, and not to be considered in the light of independent diseases.

There are some peculiar symptoms characterizing the present epidemic which seem to require a more extended notice :—

First.—The suddenness of the invasion of the illness ; or, if the attack has been some time coming on, the suddenness with which the symptoms ·of collapse set in ; and the fact that more or less collapse, in the early stages of the disease, usually occurs. This seems to have been the case in the epidemic of 1846 also. Dr. Mayne observed that in the majority of cases the patient was in his ordinary health and spirits up to the very moment of the seizure, and experienced no premonitory symptoms to warn him of his danger ; but in that epidemic few, if any, died in the state of collapse. After the lapse of a few hours, reaction, more or less perfect, ensued in all.

Second.—The almost universal occurrence of herpes in some part of the body, chiefly on the nose or on the lips.

In the accounts of this epidemic, both in France and Germany, this symptom has been much dwelt on. In a monograph, just published by Mannkopff, of Berlin, he dwells particularly on it, and adduces various reasons to prove that it is a herpes zoster, of the neural essence of which, he says, there can be no possible doubt. In almost all the cases which I witnessed, herpes was present. The nose and lips were the most frequent seat of it, but it occurred also on the shoulders, on the foot (case No. 4), on the thigh (case No. 5), on the trunk. The group of vesicles, which were usually from six to twelve in number, assumed a tolerably circular form. From the commencement the contents of the vesicles were opaque ; they flattened rapidly, and became confluent ; sometimes assumed a black colour (case No. IV) ; if the patient lived long enough (case No. 5), they died off, and left no mark. Mannkopff dwells at great length upon the occurrence of this exanthem, and quotes largely from German and Swedish physicians, as to the various regions in which it was found, and the period of its development. I observed it usually early in the disease, but in some cases it appeared late, and came out in successive crops. It appeared on the foot in case No. 4, on the day before she died.

Thirdly.—The peculiar condition of the skin, which was not observed in the former epidemic. It was noticed by Dr. Mayne, that in the worst cases " the extremities were cold and bluish, and that the disease assumed very much the aspect of cholera." I

have observed this cold and bluish condition of the entire surface of
the body in some cases. It was well marked in case No. 3 ; there
were also in several cases spots like bruises, or ecchymosis, such as
we were very familiar with in the epidemic of scurvy and typhus
fever in the year of the famine ; but in addition to these appearances,
many cases are accompanied by a distinct *eruption*, which comes
out with great rapidity, is found over all parts of the body, but
chiefly on the lower extremities ; is of a very dark colour, some-
times very deep brown, or purple, or even black ; the spots are of
various sizes and shapes, some small and round, others large and
irregular ; some appear like large spots of very black purpura, only
more mottled and more irregular in colour and shape ; others are
more confined and raised above the level of the skin, consisting in
effusion into its substance ; many patients die in this stage, but in some
the disease progresses, and these spots are absorbed, as in Case No. 5,
leaving a yellowish mark under the cuticle ; or, as occurred in cases
1 and 4, and some others, they pass into superficial gangrene,
which, in No. 4, was spreading at the time of the patient's death,
or is healed with loss of substance—as in Case No. 1.

The suddenness with which this dark-coloured eruption becomes
developed, its great extent in many instances, and the profound
collapse with which the patients are at the same time affected, give
to many of these cases a most terrific appearance, and is well calcu-
lated to inspire terror into the beholder. The number of cases in which,
during the present epidemic, this eruption has been found connected
with cerebro-spinal arachnitis, would alone be sufficient to prove
that it does not constitute or indicate any new type of disease ; but
it was already very accurately described as a constant symptom in
the epidemic of cerebro-spinal meningitis which prevailed in France,
and which was much more extensive than has ever prevailed in this
country. Lefevre observed in that epidemic impetiginous eruptions,
and Faure-Villar found in " almost all the severe cases spots of a
deep brown, or of a light purple colour, on the front of the body,
and on the extremities, not disappearing under pressure, and usually
projecting above the level of the skin. Sometimes the spots were of
an inky-black colour, and irregular in their shape and size." Dr.
Liddell, of Washington,[a] whose account shows how accurately he
observed the disease, mentions as one of the symptoms, the occurrence
of a cutaneous eruption, consisting of dark purple spots, circular in

[a] See American Journal of Medical Sciences, vol. xlix., n. s.

shape, somewhat raised above the surrounding skin, with a well-defined margin, and varying in size from a mustard seed to a pea. On incising them they presented an infiltration of dark-coloured blood in all the layers of the skin, and to some extent in the connective tissue beneath. The spots were not arranged in groups; on superficial view they presented considerable resemblance to leech-bites. In other cases " there was a strong hemorrhagic tendency exhibited." " The body was everywhere mottled; there were vibices on the knees, and petechiæ on the legs." " And on incising one of the cutaneous petechiæ it was found to consist of an ecchymosis in the substance of the true skin, and not of a mere effusion beneath the cuticle."

This dark eruption which forms so prominent a feature in those cases, is clearly owing to an infiltration of dissolved hematine, entirely dependent on the decomposed state of the blood, and is not to be looked on as simple extravasation. This is proved by the colour of the eruption being often of a pure black, sometimes brownish, but never exactly like extravasated blood, by the turbid brownish fluid in vesicles under the epidermis, so often seen accompanying these black spots, constituting what Vogel terms gangrenous action, and by the secondary action to which these spots are subjected, rarely absorption, more usually purulent or even gangrenous re-action. It is probable that in some instances, particularly those in which, like Cases II. and IV., there is a rapid effusion into the spinal canal, that the origins of the sympathetic nerve may be effected, and so, through a failure of the vaso-motor nerves, extravasation and other phenomena of deficient circulation may be developed.

There are many other peculiar symptoms which, did space allow, might be enlarged upon, the form of the delirium, the peculiar affection of the eye. This has occured in several cases; was very well marked in Case V. It commenced as a superficial ulceration of the cornea, and being confined to the lower third was, I think, clearly owing to exposure from paralysis of the lower lid, it was accompanied by severe conjunctivitis, and passed on to inflammation of the deep-seated structures, discolouration of the iris, with fixity and irregularity of the pupils. Case V. confirmed M'Kenzie's remarks on the efficacy of Belladonna in such cases. In two instances I saw the sight irreparably lost.

In some cases the ulceration of the cornea was more general, and must be referred rather to a lesion of the fifth nerve, being accom-

panied with more or less anesthesia. In one of these cases the whole eyeball rapidly wasted. In all the cases it was the right eye which was affected. The frequency of strabismus may be accounted for by the sixth nerve being, from its situation close to the pons varolii, so often implicated in the disease.

Affections of the joints I observed in very few; but the swelling of the knee-joint in Case V. was very remarkable, and evidently is to be considered as a part of the disease.

Mannkopff, after adducing one case, in which he himself observed redness and pain of the left wrist and ankle, similar to an acute rheumatism of the joints, goes on to say, that as formerly the sero-purulent effusions into the joints were stated by the Swedish Physicians (Hirsch Henob. VIII, 630), to be concomitants of this disease; so also, in recent times have acute swellings of the joints been observed, if not as often, yet sufficiently so, to prevent their being considered altogether an accidental occurrence. He refers, also, to swelling of the joints described as rheumatic, which, in cases by Reinecker and Wunderlich, preceded the meningitic symptoms, and a case of obstinate effusion which occurred to Pfeiffer during conva-lescence. The French physicians moreover, he says, report of an epidemic meningitis alternately, with acute rheumatism of the joints (Häser, l.c. S. 688), and during the progress of the late epidemic, and usually early in it, inflammation and acute swelling of different joints, occurred in America (Draper), and in Germany (Frentzel, Niemeyer, &c., &c.), which sometimes rapidly subsided, and often became metastatic, as in the ordinary rheumatic affection of joints.

The condition of the urine must also be observed. In almost all who die in the early stage it is found to be albuminous; this I consider to be merely another proof of the extraordinary fluidity of the blood, and its strong tendency to extravasation. In those who survive to a more lengthened period, I usually found the urine of very high density, and loaded with phosphates.

Diagnosis.—While the French authors, in the matter of diagnosis, dwell chiefly upon tetanus, typhoid fever, and a fatal (pernicieuse) intermittent; American authors endeavour to distinguish this spotted fever with cerebro-spinal meningitis from the ordinary typhus.

I have seen very few cases of the present epidemic which could be mistaken for any of these diseases. Cases of the sporadic form of cerebro-spinal meningitis may assimilate the diseases enumerated by French writers, but not the epidemic form, and American

authors themselves, Liddell and Upham in particular, have so well laid down the distinctive marks between typhus fever and cerebro-spinal meningitis with dark eruption that it is difficult to confound them: Murchison, I conceive, has utterly failed in his attempt to connect them. The three diseases which I have seen cases of this epidemic mistaken for, are:—1st. The sporadic form of cerebro-spinal meningitis; as I observed at the commencement of these remarks, cases of the disease in this form are not unfrequent; but the symptoms of nervous lesion are seldom associated with those of excessive fluidity of the blood, consequently, there are wanting the extreme collapse and the peculiar eruption. The sporadic form, moreover, presents frequently many symptoms of a more or less inflammatory type; and what may be termed an antiphlogistic line of treatment is often successful. Many of these cases recover under the free administration of mercury and repeated leeching. Hot skin hyperesthesia, retracted head, are also symptomatic of the sporadic form, while, on the contrary, it wants those spinal symptoms which may be supposed to originate in the medulla oblongata, viz., extreme dyspnea without any affection of the respiratory organs, spasm or paralysis of the pharynx, aphonia, &c., &c. Diagnosis between the epidemic and sporadic forms is of consequence, first and principally as to treatment; and, secondly, as to prognosis, the sporadic form being in my experience much more amenable to treatment. Mann-kopff, however, the latest writer on the subject, considers the epidemic form the less fatal.

2nd. Wherever cerebro-spinal meningitis has prevailed, it has been observed that a malignant form of measles has also existed at the same time. I have seen several cases of this latter affection during the last few months—many of them fatal, and some of them mistaken for the cerebro-spinal epidemic. They have some leading features in common.

1. The rapidity with which the eruption is developed—the entire body is covered with it sometimes in less than six hours.

2. The very dark colour of the eruption, and its being inter-spersed copiously with petechiæ.

3. The sudden and often extreme collapse which accompanies the development of the disease. A satisfactory diagnosis can, however, usually be made.

Although the debility in rubeola may be very great, it never approaches the almost paralytic condition which is found in the very severe cases of spinal fever, and although there may be many

spots of petechiæ, there are never found those ecchymoses from decomposed blood in the substance of the true skin, which are so characteristic of the epidemic; and while the rubeolar eruption is dark-coloured in the extreme it retains its characteristic of being an elevated eruption, and affecting more or less the crescentic form.

A case of *rubeola nigra* will also be accompanied from the commencement with more or less of coryza and symptoms of laryngeal or tracheal, or bronchial congestion, or all combined. In the cerebro-spinal epidemic, I have observed that the pulmonary affections consist in what may be termed secondary phenomena, œdema of the lungs, or diffuse pulmonary apoplexy, and these combined with a more or less emphysematous condition of the anterior portions.

This appearance was exceedingly well marked in Jane Elliott, aged thirty-five, who died in the Whitworth Hospital on April 18th. She received a severe mental shock, which she felt to be her death-blow. She vomited frequently, and became rapidly weaker. She came into hospital on the 16th, being of a light yellow colour. On the 17th the upper part of her body was covered with the peculiar dark eruption. Her breathing suddenly became most rapid—62 in the minute—and she quickly became comatose.

Both lungs were the seat of most intense diffuse pulmonary apoplexy, while the anterior portions were largely emphysematous. The brain and spinal cord exhibited all the characteristics of intense cerebro-spinal meningitis with, what has not usually been found, lymphy exudation in the lateral ventricles.

3rd. To those who have not seen many cases of this epidemic, it may seem extraordinary to state that in some few instances it strongly assimilated hysteria; but I have observed, while the majority of the cases were unmistakably well marked—some few advanced very treacherously—for a day or two there was slight malaise and vomiting, lassitude, occasional pains in the back and down the limbs; these were all relieved by warmth and rest, but again recurred, and were accompanied with more or less pain on pressure, amounting almost to hyperesthesia of various parts; and those symptoms occurring in delicate females, were occasionally mistaken and treated as hysterical, until in some instances the patient's friends and the physician were surprised by the rapidly fatal termination of the illness. I have known at least three such cases to have occurred in this city during the past month. I need not dwell upon the means of diagnosis in this case, but merely observe that when such a formidable epidemic prevails we cannot be too cautious in our diagnosis

or prognosis.   Many other forms of fever[a] will, from the commence-
ment, take some colouring from the epidemic, and many will, in
their progress, be influenced by it.

I would return to the subject of *Prognosis* to state briefly how
very uncertain it is.   In all cases it is unfavourable.   The mortality
at the Hardwicke hospital has been at the rate of 80 per cent., and
it would appear that middle-aged (eighteen to thirty-six) persons
are most disposed to contract the disease and to die of it.   It is to
be observed that cerebral symptoms are, *quoad vitam*, more serious
than spinal.   Some cases, as Dermody, No. V., may survive all
the acute symptoms, and eventually sink under those of a disorga-
nized spinal cord.

Delirium, however extravagant, particularly if it occur only at
night, is a much less unfavourable sign than coma, which, if it come
on suddenly, may be looked upon as almost fatal.

The extent and dark colour of the eruption, the early stage and
rapidity of its development are another set of symptoms which
influence the prognosis.   Some German writers showing how
familiar they are with the dark eruption in these cases, speak of the
more or less *cyanotic* condition or appearance of the patient as most
directly influencing the prognosis ; others of them look upon the
supervention of œdema of the lungs as the most fatal symptom.   All
authors seem to be agreed that the stage of collapse is the most
fatal, and that the prognosis improves as the recovery from that
is the more complete.

Treatment.—Mannkopff begins his section on treatment by stating
that many cases are so rapid as not to admit of any ; and in this all
are agreed who have seen many die in what may be termed the first
stage of the disease.   Professor Banks, in his observations on a
remarkable case of this kind in the present volume of this journal,
says :—" They are fearfully appalling in the suddenness of the
seizure, and the rapidity with which collapse sets in, all remedial
agents in such a case are alike powerless, nothing seems to have the
slightest influence in staying the fatal progress of the disease."

In many cases the system is so utterly prostrated that the strongest
counter irritation, mustard and turpentine—turpentine and liquor

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[a] During the last month I have observed that few cases of typhus fever have been
admitted into my wards in the Hardwicke hospital without having some symptoms
referable to the cerebro-spinal system.   In some cases they have arisen towards the
close of the fever, and have proved very formidable.

ammoniæ—are borne without producing any perceptible effect, either upon the capillary circulation, or upon the patient's senses.

What I have seen most useful in the stage of collapse is external warmth applied to the entire surface by means of flannel bags containing roasted salt, applied along the spine, along the chest, inside the arms, and to the feet and legs, and between them. This will not prevent the application of strong counter irritant applications to the epigastrium, upper part of the spine, and wherever else they may be considered advisable. Small quantities of brandy in iced water may, at the same time, be given in repeated doses, and if the stomach be very irritable, two or three drops of laudanum, or a drop of hydrocyanic acid may be added to each dose. But supposing the patient to have recovered from the stage of collapse, and the symptoms of perverted sensation—diminished or exalted—to have set in, we may consider what line of treatment is to be adopted. So far as the question of treatment is concerned, this is the most important stage; but it is not possible in this, any more than in any form of fever, to lay down absolute rules, or to recommend any one specific plan. Some patients rise out of the collapse with hot skin, injected conjunctivæ, perhaps strabismus, pain and heat of head, deafness and flushed face ; these, although the pulse be small and thready, and the body be covered with the large dark spots, or small petechiæ, will derive benefit from leeching and the use of mercury, supporting the strength with small quantities of wine or brandy, thus Wm. Kennedy, aged sixteen, a builder, admitted on the 30th of March, cold, pulseless, stupid, and with dark eruption : on the 1st of April had intense headache, suffused eyes, hot skin, hyper-esthesia, very small pulse, eruption not declining. He was ordered four leeches to the temples, and half a grain of calomel, with two or three of prepared chalk every hour. Two leeches were afterwards applied two or three times, and the calomel was continued until his gums were slightly affected. He made a good recovery. I think the very small doses of mercury very frequently administered is the most useful and safest way to exhibit it in this disease. In Others, on the contrary, like Case No. V., reaction is never excited, symptoms, partly of irritation, partly of compression, of the nervous centres set in, while the lesions of the circulating system persist, or become even more manifest. In such cases I have found great benefit from the combined action of quinine and belladonna in large and frequently repeated doses. Thus in the case of Rose M'Mahon, aged thirty-three, admitted 17th of March, in collapse, with dark eruption,

on following day, pulse returning, constantly moaning, complaining of great pain in head and neck, strabismus, inability to pass urine, eruption increasing. I ordered her two grains of sulphate of quinine, and a grain of extract of belladonna in a pill every three hours, and this treatment was steadily persevered in for several days, increasing or diminishing the quantity according to the urgency of the symptoms, until they yielded altogether; the head was shaved and blistered and she had a small quantity of wine daily. This woman was for several days in a most critical state. She had well marked herpes zoster, profuse perspirations, constant delirium, and what I observed in several, an impulse to swallow everything they would lay hands on, the corners of the bed clothes, towels, and even if they were not carefully watched, the blisters or mercurial dressings which were usually applied to the head or back. She was discharged perfectly cured on the 12th of April. In other cases I gave the belladonna even more frequently. In Case No. V. I gave it for a few days in grain doses every hour until it produced its full effects, a few small doses of opium remedied the gastro-intestinal disturbances which were threatened.

In some cases, particularly in those in which there was much dysphagia, I found much benefit from a liniment composed of the tincture or a strong solution of the extract of belladonna, rubbed well into the nape of the neck and between the shoulders. When the friction could not be borne, a hot linseed poultice, made with either of these preparations, and applied with a covering of oiled silk was often of great advantage. And the extract applied thickly and frequently around the eyes, in the cases of ulcerated cornea, &c., had evidently a more powerful remedial action than could be referred to a mere dilatation of the pupil.

Iodide of potassium seemed to be of use only in cases where all the acute symptoms had completely disappeared, and the patient was still troubled with pains or stiffness in the back or limbs.

I may be expected to offer some remarks on the use of opium, the efficacy of which in this disease has been so much lauded by some physicians, American authors in particular. I tried the effect of it in pretty large doses (from half a gr. to gr. ii. every three hours), sometimes in combination with mercury, sometimes by itself, in cases in which there was either very great pain or continued insomnia, but I was not encouraged to proceed with it, it always dried the tongue and seldom produced sleep, which, if it did come, was not

refreshing, and the patient seemed to me always to wake up in, as it were, a greater paroxysm of pain.

I will conclude these brief remarks on treatment, by a quotation from Mannkopff's recent work, which seems to me to be worth recording :—

"While our efforts must be chiefly directed against the local inflammation of the meninges, we must never forget that we have to do with a zymotic disease, which tends to lower the powers of life; hence antiphlogistics must be used with caution, and if thus employed they do not suffice to allay irritation, we must also employ quieting means. But if the bodily powers are already very low we must abstain from antiphlogistics, and have recourse to rapidly acting stimulants. In convalescence we must employ these remedies which promote absorption, while we support the patient's strength. We are also to remember throughout the treatment of the case, that other organs besides the nervous centres, the respiratory organs in particular, are apt to suffer, and, therefore, a careful watch must be kept, and such complications be treated on sound general principles."

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

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Lectures on the Study of Fever. By Alfred Hudson, M.D.,
M.R.I.A.; Physician to the Meath Hospital.

A work on any practical subject recording the experience of Dr.
Hudson must be a valuable boon to the profession. With peculiar
pleasure, then, we hail a volume on the subject of "fever, the disease
which," in the author's words, "beyond all others, presents the strongest
claims to our careful investigation, whether regarded as an object of
scientific interest or of social importance; whether on account of the
varied and complex phenomena it offers for our investigation, or the
immense influence which it exercises upon the welfare of individuals
and of the community."

The lectures are dedicated to the author's colleague, Dr. Stokes,
and were delivered to the students of the Meath Hospital to guide
them in the bedside analyses of cases of fever; a subject which, in
the author's opinion, has as yet been but imperfectly cultivated, but
to the pursuit of which he ardently encourages the student by telling
him that "it more than any other disease will call into requisition his
knowledge of healthy and perverted function; educate his faculty
of observation, cultivate his talent for judging the value of existing
signs and symptoms," adding that while "no single disease will teach
the student so much that is of value, or so train him for the future
practice of his profession as fever, yet it must be admitted that
the difficulty of the study is in proportion to its interest." To solve
these difficulties or to aid in their solution is the aim of the author,
and we will now endeavour briefly to analyse how far he has effected
his object.

The first lecture is devoted to the "theory of fever," and it is
classed with all other morbid poisons as producing its effects on the
human system by means of catalysis, which the author explains to
mean that the "poison has a force or power by which a compound
body like the blood is decomposed by mere contact with it." We
would rather incline to the belief that in the majority of cases the
fever poison is introduced directly through the nervous system; in
no other possible way can be accounted for, the instantaneous com-
munication of the disease which the recipient himself is often
distinctly conscious of. Of course the blood becomes vitiated at a

more or less early period; but, even then, we doubt that it is strictly in the manner of catalysis, but rather by cell growth, which will more satisfactorily account for what Dr. Hudson himself so much insists upon, the susceptibility to the disease being exhausted, and the various atttempts at crisis at various periods.

Lecture IV. is devoted to pathology and symptomatology. The different modes of invasion of the various forms of fever is, of course, first considered. The author holds that if the fever be traceable to communication with a typhus patient it will prove typhus; but if the cause be civic miasm, enteric fever will follow. The classification of the pathological phenomena is the usnal one of primary and secondary, but it is very intelligibly put :—

" Primary or essential arising out of the action of the poison on the blood and nervous system and its affinity for certain tissues or organs, as well as out of the special predisposition of the organ which in certain states may be said to attack the fever poison.

" Secondary or accidental arising (*a*) from some peculiar exciting cause; (*b*) from some secondary blood contamination ; (*c*) from reactive irritation. The secondary phenomena alone can be termed complications ; those of the first class are either purely tonic or arise from the tendency of the poison to be eliminated by certain surfaces or excreting organs. To the tonic action of the poison we refer the majority of the nervous symptoms of typhus. To the elimination effort of the system we ascribe the infiltration into Peyer's follicles and the mesenteric glands in typhoid."

The symptoms of the various forms of fever are considered seriatim and completely. We cannot follow them throughout, but we may refer to the value set upon at least two :—1st. Temperature, in which the conclusions of Dr. Aitken are strictly adopted ; and the author's faith in their value is well shown by his prescience (some would term it rashness) in cupping a patient advanced in typhus, because his temperature rising four degrees, with increased rapidity of breathing, indicated the approach of a pneumonia of the sthenic form with rusty expectoration.

In the remarks upon the characteristic eruptions we find the following :—

" You will occasionally find it by no means easy to distinguish the one form of eruption from the other. An imperfectly developed or discrete typhus eruption in its earlier stages may be readily mistaken for a typhoid, if this is more than usually abundant ; the frequent uncertainty of the date of access of typhoid favouring this error. Such cases require the

exercise of caution and further investigation, and you will best arrive at an accurate diagnosis by a careful inquiry into the origin and previous history as well as the accompanying symptoms of each case. Not unfrequently we will have reason to believe that the two poisons co-exist in the case, the conditions being commingled or the one succeeding the other."

We consider this statement to be one of great importance. There can be no question as to these facts ; but, on the other hand, they are no evidence of the identity of the two diseases which they are daily quoted to prove. There is too much stress laid upon the one symptom of the eruption in the matter of diagnosis, and if any physician could be found so imprudent as to rely upon that or any one other symptom he would frequently be mistaken. The complete distinction between typhus and enteric fever is now so universally recognised that it seems to many strange that they should ever have been connected. Yet there are some who still assert the unity of the two diseases, because in individual cases some particular symptom will frequently arise, which, according to their rule, belongs more properly to the other disease ; thus, for instance, if diarrhea occur in an otherwise well marked case of typhus, or if, in what would otherwise be termed enteric fever, the temperature rise very high very early in the disease, such cases would be termed *mixed cases*. The distinctive marks between typhus and enteric fever are, by almost all authors, now clearly laid down, and Dr. Hudson also holds their complete and perfect distinctness ; and we may here anticipate his remarks upon diagnosis, and enumerate the following as the broad grounds upon which he bases the distinction. The two diseases differ.

1. In their invasion and early history.
2. In their conformity to the laws of periodicity.
3. In their duration and mode of termination.
4. In their external phenomena, more especially their eruptions.
5. In the special affinities of the poisons, the order of symptoms, and their internal pathology.
6. In the mode of fatal termination.
7. In the anatomical appearances.
8. In the law regulating the mortality with regard to age.
9. In the comparative rapidity and security of the convalescence in typhus, and its complete exemption from relapse as contrasted with the comparative certainty of relapse in epidemic synocha ; its frequent occurrence in typhoid ; and the other risks and uncertainties of the convalescence in this disease.

Instead of describing the different forms of fever as they are met with, Dr. Hudson, we think wisely, goes through the different lesions as they are found to occur in the various organs.   Lectures V. and VI. are devoted to the cardiac and pulmonary lesions.

Dr. Stokes' remarks upon the softened condition of the heart in typhus are quoted at full length, and that condition of lung which he has termed aborted or arrested typhus, an explanation which we can by no means accept.

There are other ways for explaining the phenomena connected with this disease : why should not the fever, although of a very low type, be symptomatic of the local lesion which we know to be most varied in point of time as to its development, or at least in the proof of its existence by physical signs ; and we confess it is contrary to all our experience of typhus fever to suppose that once established in the system it will *abort*.   The analogy adduced that in certain cases of simple variola we see the fever to subside on the appearance of the pustule is really no analogy at all, nor need we delay to explain how it is not so.

Dr. Hudson alludes to another form of pulmonary affection which he says is unnoticed by any other reader :—" In several instances in which fever was attended with cerebral symptoms, particularly with great emotional excitement, and with marked cerebral breathing. These symptoms have been succeeded, after some days, by inflammatory congestion of the upper lobe of one or other lung.   This complication differs from the affection described by Dr. Stokes : first, in the period in which it has occurred ; secondly, in not being attended with resolution of the fever ; and lastly, in having been always preceded by highly marked excitement of the emotional nervous centres, as if originating in the nerves of the respiratory organs."

There is no doubt but that irritation of the gangliform plexus of the vagus will cause general and intense pneumonia ; and we can therefore imagine that, as Jones very well puts it, " certain nerves, when stimulated, exert a very considerable influence in the districts to which they are distributed, in the way of increasing the amount of blood circulating through the tissues, and herein exactly antagonise the ordinary vaso-mortor nerves accompanying the arteries whose activity induces the opposite condition."

Lecture VII. comprises the *abdominal lesions* or rather the derangements of the digestive organs.   The absence of thirst is judiciously considered as one of the most serious symptoms, more especially when conjoined with other forms of an obsthesia, to which,

and not to an arrest of the function of nutrition, as stated by Corrigan, it is referred. The different forms of vomiting are very well described, and the different forms of diarrhea; and the student is warned that even in far advanced enteric fever there may be no diarrhea.

Lecture VIII. is on the derangements of the urinary organs, and is occupied with many practical remarks upon their nature and mode of occurrence. The two last subjects under this heading are particularly worthy of being remembered—1st. Tthat what may appear at first view to be simply the adynamia of fever is often, in a great measure, due to secondary blood contamination—in fact, to uremia; and 2ndly, The occurrence of bullæ during the course of fever should lead us to pay more than ordinary attention to the state of the urinary secretion. The existence of these bullæ being ascribed by Henderson and others to the conversion of the retained urea into carbonate of ammonia, which has the power of dissolving the fibrin of the blood.

Lectures IX., X., and XI. comprise the cerebro-spinal lesions, the importance of which is not over-estimated in the assertion, that while they are not seldom obscure, latent, and difficult of diagnosis, the safety of the patient will often depend upon the sagacity with which they may be recognised or even anticipated, and the promptitude with which they may be met by suitable and energetic treatment. The various causes of these lesions are gone over seriatim and fully. The difference of the symptoms, according to the different parts of the cerebro-spinal system affected—the principal object is, of course, to show how the symptoms arising from reflex irritation—from the toxic action of the fever poison—from the effects of secondary blood poisoning in its various forms—are all to be distinguished from each other, and from those cases in which there is more or less of organic lesion, which the author, in our opinion, most erroneously considers the effect of *inflammation.* The cases which he adduces in support are most unfortunate for his purpose and inapplicable.

Lecture XII. enters fully into the subject of diagnosis; and Lecture XIII. exhausts the subject of prognosis. It is very comprehensive, and very accurate, and will repay a careful perusal. Lastly, Lectures XIV. and XV. are devoted to *treatment.* In these important chapters the first subject considered is, " are there any means by which the operations of the poison once set up may be arrested, shortened, or modified, if these measures are employed at an early period"—in other words can fever be arrested? Dr. Hudson

considers " that hundreds of cases of fever have been arrested chiefly by those measures which medical fashion, rather than reason or experience, has long since consigned to comparative neglect, viz., blood-letting, emetics, and cold affusion." We may pass over the arguments of Watson, Todd, &c., on the impossibility of proving the success of this plan; when it fails it may be said to have been tried too late; when it succeeds it cannot be proved that any disease, much less fever, was really cut short. We have often known a set of symptoms as alarming and decided as ever ushered in a specific fever disregarded, and not followed by any bad consequences worse than a mild sore throat or an attack of herpes, while the infection was directly from a typhus patient. But we think the principle is erroneous that typhus once established can be arrested, and we look upon the practice alluded to as most hazardous. We can call to mind more than one valuable life sacrificed from adopting these ideas, and we feel that we cannot too strongly express our disapproval of the advice; but let us not be misunderstood. We have no fears but that, in the hands of Dr. Hudson, such practice, if adopted, would be most judiciously carried out; the fit objects for it most carefully selected, and therefore the success of it be almost certain, or at least it would not do harm; but knowing that the fit objects for it are but the very few, we do fear lest, justified by such authority as Dr. Hudson, many may imagine that it is a sound practice to be generally adopted, and we fear most of all that medical men will venture to practice it upon themselves. It is true, Dr. Hudson says, that to be successful these measures should be employed within the first thirty-six hours; but where there is such an inducement held out, as the prospect of cutting short a fever, there are those who will venture on any measure, however desperate. We can unfortunately call to mind not a few valuable lives thus lost. A state of collapse has been induced, and the power to rally from it had been taken away. An irritability of the stomach has been brought on, and it never again could be calmed. In our opinion the cases are few indeed to which this plan of treatment is applicable; and, without any reproach to the profession, we may add that the hands into which its administration should be trusted are also fewer. Dr. Hudson goes on to mention two other eliminant medicines, sudorifics and purgatives. He has followed up the action of the emetic by sudorifics with advantage, and has heard of other physicians apparently cutting short fevers by producing copious and long-continued sweating. He adds:—" Once, however, the disease is

established, no practice can be more injurious than either the emetic or diaphoretic treatment, unless it be the purgative ;" but the difficult point to determine is when the disease is to be considered established ; we cannot reckon it by time—twenty-four or thirty-six hours—as proposed, patients have died of fever in less.

The sudorific plan is of all the eliminative modes that usually received with most favour, and for that reason requires a word of caution.   As we have seen an uncontrollable irritability of the stomach induced by the emetic plan, so we have seen a condition of the most profound debility induced by the sudorific plan ; moreover, in our opinion, it induces a tendency to an early attempt at crisis by perspiration, which, to say the least, is not desirable.   " I have such a dread of crisis by perspiration," writes Corrigan, " that I would rather see a case of maculated fever considerably prolonged than that the risk of crisis by perspiration should be incurred."

In our opinion this subject was treated of by Marsh exactly forty years ago in a manner which time and experience have proved to be the well-grounded and judicious practice.   In the remarks of that eminent physician it will be observed that while he fully recognised the importance of the treatment in the latent period, he was observant of the cases in which advantage was to be expected from it, and of the individuals on whom it could with safety be practised.

" The latent period of fever is a time during which the judicious application of remedies would frequently avail to render the ensuing malady less severe and dangerous ; and frequently too a slight ailment is converted by neglect and mismanagement during the latent period into a serious and dangerous illness.   In conducting the treatment it is of considerable moment to be able to learn the origin of the complaint.   The diseases which arise from impressions of cold upon the surface require a different mode of treatment from those which spring from a contagious source.   The former will yield more readily and certainly than the latter to medical treatment, and may even be frequently arrested in their progress, and cut short altogether.   Even in contagious fever this may occasionally, but I believe infrequently, be accomplished   In general, notwithstanding every effort, contagious disease will run a certain course, and though it may be mitigated and the severity of its symptoms abated, it will still proceed, and will not often be stopped short in its career.   Occasionally, powerful emetics administered during the latent period will give the system a shock sufficient to alter the course of the symptoms, and to enable the constitution to

throw off the disease. Emetics, however, even at this early period, are not suited to all cases of fever. Sometimes I have known this remedy produce little other effect than determine morbid action to the stomach, and render that viscus exceedingly irritable during the whole course of the fever. The effects of an emetic will be rendered more effectual if followed by an opiate. *In many cases of relapse* I have adopted, with much advantage, this mode of treatment. On the occurrence of those symptoms which indicate a return of fever I have given a mild emetic, and after its operation a full opiate; and have occasionally found the patient next morning nearly free from febrile symptoms, or if still existing, so mild as to promise a favourable and a mitigated disease."

" The utmost which in general can be done during the early stage of fever is to mitigate the symptoms and render the disease mild."

" I do not think that our attempts to cut short contagious fever are as often successful as is generally believed; and I am sure it requires much judgment to determine the kind of case and constitution in which it is safe to make the attempt." The remainder of Marsh's observations on the treatment of the latent period of fever are also well worth perusal; his cautions against the abuse of purgatives; his remarks on antimonials, &c., &c., we would gladly quote, as bearing upon the subject of the cutting short of fever, but want of space prevents us.

Dr. Hudson's remarks upon the abuse of purgatives are excellent, as also are his observations upon the proper administration of food. He puts into its proper place Graves' overstrained and perverted ideas about food in fevers. The tendency of the present day is unquestionably to over-feed and to over-stimulate in fever, so that the sentence—" some are even positively injured by it" (wine), is one deserving of great consideration, as also, " food like wine should be given at moderately long intervals;" and again, " I say, liquid nourishment, because the stomach of a fever patient is incapable of properly digesting solid food."

With regard to sleep the direction is well-advised to secure the return of sleep, not always by the exhibition of narcotics, but by the judicious management of the patient with reference to this function.

We doubt that the author has advised the best remedial measures in cases of hemorrhage from the bowels. His observations on the urine are very important. It is not sufficient merely that the urine is not retained, we should also satisfy ourselves that urea is not

retained.   The causes, symptoms, and treatment of this most dangerous occurrence are fully considered.

We next come to the cerebro-spinal lesions in fever, the proper treatment of which is perhaps the most difficult problem which can be put.   The advantages of wine, opium, antimony, local and general bleeding, mercury, turpentine—are all discussed and allusion is made, if not a full description given, of the cases to which each remedy is applicable.

The author dwells much upon, and favours highly the plan of treatment by tartar emetic, with or without opium, in certain cases, the marked success of which he considers to be due to its eliminative action " by which in most of Graves' cases evacuation was brought on in several modes, as by vomiting, purging, and copious diaphoresis or diuresis."   Dr. Hudson advocates also the use of the lancet more freely than in our opinion the epidemics of the day warrant.   He considers " that the ill effects ascribed to bleeding have often been strictly due to the abstinence enforced at the same time," and he cautions the practitioner to repair the waste produced, by administering nourishment, " and also to obviate the nervous excitement and irritability which so frequently follow the abstraction of blood by means of opium, and even by wine or brandy."   We would be slow to reject the testimony of Dr. Hudson upon the efficacy of any plan of treatment.   He has the character (and he deserves it) of being a safe and a judicious practitioner ; but on his own showing, bleeding and tartar emetic are hazardous remedies.   We are satisfied that they have succeeded in Dr. Hudson's hands, and they would probably be successful with others ; and we, therefore, highly approve of their being *recorded*, but we are satisfied that they are measures calculated for " desperate circumstances," and not calculated to enter into the treatment of ordinary cases of fever.   There is a form of reflex cerebro-spinal irritation which we have often seen, but which Dr. Hudson has not noticed.   It occurs very late in fever, and is caused by great accumulation in the intestines.   The symptoms of cerebro-spinal disturbance are extreme, and what chiefly renders the case difficult of diagnosis is the peculiar condition of the abdomen.   It is well described by a French physician, who is evidently familiar with it. " L'abdomen se resserre, se creuse, pour ainsi dire, en s'appliquant contre la colonne vertebrale, les dejections alvines que l'excretion des urines se suppriment.   En un mot toutes les fonctions sont pervertès ou suspendues."   When under the action of suitable purgation, &c., the alvine contents are discharged, the quantity found to have been

retained is most surprising. Unless seen it would not be credible that an abdomen so contracted could have contained even half so much. The almost immediate disappearance of the cerebro-spinal symptoms prove the two conditions to have been in the relation of cause and effect.

We next have some remarks upon critical days, and the variations of treatment likely to be required at the time of crisis—the form of delirium which sometimes occurs at this period and its treatment—its aggravation by (if not origin in) blistering. This latter caution we can re-echo, for we have seen, more than once, confirmed and prolonged mania follow the injudicious treatment of this delirium. After a few further practical remarks upon ulceration of the intestine and its consequences, the author closes these chapters with some comprehensive rules as to the general management and special treatment of fever.

The appendix extends over 68 pages, and contains many valuable cases and extracts from lectures and reports in illustration of the author's views, or of facts to which he has referred, and it ends with some well-digested remarks upon the long-recognised differences between typhus and enteric fever.

We have thus carefully gone through Dr. Hudson's " Lectures on the Study of Fever," and it will be observed how comprehensive is their scope, and how fully they accomplish the object with which they were written—their attentive and careful perusal will repay the reader—they are well arranged, although on a plan not generally adopted, and one by no means easy for the writer, but most useful for the student—collecting the symptoms common to all classes of fever according to particular sets of organs, and then dissociating them as they indicate each particular kind.

We regret that we cannot congratulate the publisher on his part of this work. The *getting up* of the volume is discreditable to Dublin, and the mistakes which the reader has passed over are numerous. Besides a long *Errata,* we find *consolation* for *consolidation ;* the *colour* contained *faces,* instead of the *colon* contained *fæces,* and various other such mistakes ; and all through the work *œ* for *æ;* and though we do not ourselves use these diphthongs in words fully established as English, because Johnson, Mayne, and our best authorities say they have not, properly speaking, any place in the English language, we hold that those who do use them should follow the original construction of the words in which they occur.

*Irish Sanitary Arrangements under the Poor Law and Medical Charities Acts.**

FOR many years past the preservation and improvement of public health has been one of the most important branches of social science, and has been much discussed at social science congresses and meetings, and in connexion with the efforts made for the amelioration of the social condition of the people, none have been more strenuously advocated or more deserving of advocacy than that of sanitary reform; various and strong representations have been made by sanitary reformers, and by the Poor Law Commissioners in different annual reports to Parliament, respecting the defective state of the laws affecting public health and the necessity of extending to Ireland the provisions of the English Nuisance Removal and Diseases Prevention Acts of 1855 and 1860. At last these efforts have been crowned with success, by the passing, during the past session, of " The Sanitary Act," which received the Royal assent on the 7th August last, and which was thus referred to by Sir Robert Kane in his address at the opening meeting of the present session of the Statistical Society :—" We have obtained a Consolidated and improved Sanitary Act for Ireland, organizing, under the direction of the public authorities, an admirable system of control and supervision, through which it may be hoped that these agencies, whether of commission or omission, by which disease might be generated or conveyed, may be, if not absolutely removed, at least materially narrowed in their range of influence, and mitigated in their force."

It is a matter of congratulation that the work of sanitary reform has been brought to such a successful issue, and is now, with rare exceptions, being actively and earnestly carried out by the Government, the Poor Law Commissioners, the Civic Authorities, and Boards of Guardians throughout Ireland, to whom ample powers are given for sanitary regulations.

Before entering into the details of the organization and machinery for affording medical relief and enforcing sanitary regulations under the Medical Charities and the Sanitary Acts, it is but right to observe that we are not unmindful of the vast amount of good effected by public and private efforts for the improvement of the

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* This article was prepared for publication some months ago, but appears more appropriately now in connexion with the history of the cholera epidemic.

condition of the people, and also, that we have no desire to over-look the noble system of hospital succour for which our metropolis and country is celebrated. We simply desire, on the present occasion, to confine ourselves to a review of the machinery by which the Legislature has placed medical relief within the reach of every proper recipient, and by which the authorities are enabled at once, upon the appearance or threatened invasion of any epidemic disease, to extend their operations, and exercise the powers given them under the Acts already mentioned for the relief and protection of society.

The observations which follow, in which these advantages are stated more in detail, will, we think, establish the following propositions:—

I. That Ireland is at present in the enjoyment of a system of medical relief equal, if not superior, to any country in Europe, and certainly very much in advance of that which prevails in England.

II. That the organization of the system, which is comparatively inexpensive, is equally applicable to the most crowded city and the wildest and most remote country or mountain district.

III. That adequate medical relief is accessible to all poor persons needing it, without delay or difficulty.

IV. That the organization is such as to be immediately available in the event of an invasion or outbreak of epidemic disease, and is capable of immediate expansion to meet any emergency that may arise, and that being thus always prepared for an emergency, any invasion of epidemic disease can be met at once, and the calamitous results, both in a sanitary and economic point of view, which must follow, if the preparations had to be made after the disease had established itself, avoided.

Since the introduction of the Poor Laws into Ireland the geographical arrangement and formation of unions have been frequently turned to account, by the Legislature, for purposes of an imperial and local nature. On the 11th September, 1838, when instructions were issued from the Poor Law Commission Office in Dublin to the assistant commissioners, respecting the principles to be observed by them in the formation of unions, the following words were used:—" It is highly important that all the unions should be formed as compact and complete as possible; for when the country shall have been worked up into unions, each having an organized machinery and a principle of self-government, and with the market town as a centre or little capital, it can scarcely

be doubted that they will be made available for other purposes as well as for the administration of the Poor Law." It is remarkable how these prescient views have been fulfilled, the Legislature having since constantly made use of the Poor Law machinery and officers for the purpose of obtaining parliamentary returns, and carrying into effect measures of a practical and important character connected with valuation, rating, parliamentary franchise, burial boards, vaccination, the registration of births, deaths, and marriages, and, lastly, committing to the central Poor Law authority the care of the public health and sanitary laws of the country, and the duties connected with them, which in England are under the control of the Board of Health and the Privy Council.

From the latest information available, it appears that in the 163 Unions, into which Ireland is divided, there are 3,438 electoral divisions, represented by 7,456 guardians, who meet weekly for the transaction of business. It also appears by the last Medical Charities Report, presented by the Poor Law Commissioners to Parliament, that the 163 Unions are likewise divided into 716 dispensary districts, with 1,038 dispensary stations, under the care of 786 medical officers and 39 apothecaries, and that in 54 of the districts, 77 qualified trained midwives have been appointed.

We believe that every workhouse in Ireland has an infirmary attached to it, and that almost every Union is now provided with a detached fever hospital, situate at or near to the workhouse premises, serving not only as a protection against contagious disease to the establishment itself, but as an hospital available for the population of the Union.

The average distance of the extreme limit of each Union from its workhouse is about eight miles, and the fever hospital or fever ward attached to it, forms a most valuable check to the spread of contagious epidemic disease, both in town and country.

The Dispensaries are under the management of 14,215 members of committee. These committees are constituted of Guardians resident in the district, or occupying, or possessing property in it; and of resident ratepayers, possessing property of at least £30 per annum, elected by the Guardians.

Dispensary relief is afforded by the issue of tickets by members of committee, by relieving officers, and by wardens appointed by the guardians. There are, exclusive of relieving officers and wardens, whose numbers we have no means of ascertaining, 14,214 persons,

or one person to every 1,464 acres, 98 persons to each Union, and one person to every 407 of the population, on the average, distributed over the country, authorized to grant tickets. The extreme distance of the limits of dispensary districts from the nearest dispensary station averages about two miles.

Placards setting forth the dispensary arrangements, with which it concerns the poor to be made acquainted, and the names and residences of the persons authorized to issue relief tickets, are annually posted throughout the union and district. In addition, boards of guardians are required to furnish to each constabulary and police station, information regarding the limits of relief and dispensary districts, and the names of persons competent to afford relief, and responsible for doing so.

This arrangement places the means of affording information respecting Poor Law and Medical relief within the power of a well organized intelligent body of 11,162 men, and 653 superior officers.

There is also a large staff of relieving officers, whose duties and powers are very extensive, for affording medical and provisional relief in sick and urgent cases of destitution.

The number of midwives holding office under the Medical Charities Act appears to be very insignificant; we trust that the importance of more generally employing this useful class of females will be more fully recognized throughout the country.

These appointments are of great value; they are congenial to the wishes of the poor, and are likely, in many cases, to lessen suffering and save life; they would relieve the medical officers from an irksome attendance without, at the same time, relieving them from their responsibility in serious cases.

We have heard it stated that ladies possessing a property qualification, are entitled to be appointed members of a dispensary committee; but we are not aware of any case in which they exercise a greater power than that of issuing tickets for medical relief.

Having asserted that the system of medical relief in Ireland is much in advance of what prevails in England, it is but right to support such assertion by the reproduction of a statement made by Dr. Richard Griffin, in a paper on Poor Law Medical Relief in England, published in the Transactions of the National Social Science Association for 1861, that notwithstanding the Poor Law Board requires a medical and surgical qualification, the rule is broken by guardians in Unions uncontrolled by the Poor Law

Board; he illustrates this from Lord Elcho's return of April, 1858, that no less than 632 medical officers out of 3,307, comprising the medical staff, or nearly a seventh of the whole, had but one qualification for office. Although the Poor Law Board had laid down rules that no district shall be assigned to a medical officer which exceeds in extent 15,000 statute acres, or which contains a population exceeding 15,000 persons, it appears from the same return that, owing to an unfortunate proviso in the regulations, there are 583 districts, each of which contains more than 15,000 acres, and some of which extend from 80,000 to 100,000 each; and not content with these enormous areas, the guardians have actually given 629 appointments to 291 medical officers, " thereby showing," as Dr. Griffin remarks, " a reckless disregard of the interests of the poor." Eighty-six of these districts contain 2,289,000 acres, which, at the extreme limit laid down by the Poor Law Board, would give employment to 60 more medical men. There are 23 Unions, in each of which there is only one medical officer, and one of these Unions has 122,000 acres in it. In Wales, mileage is substituted for acreage, and although seven miles is fixed for the limit of a district from the residence of a medical officer, there are 70 districts extending beyond that limit, and one up to 18 miles. There are also 120 districts in Wales, in which the population of the district exceeds 15,000, and one extends to 40,000.

Dr. Griffin also states that there are 266 medical officers who annually attend from 1,000 to 2,000 patients each.

Because properly qualified medical practitioners will not, in some Unions, take office, the guardians add indirectly to the salaries of those they employ, by giving them additional vacant districts. In their Thirteenth Annual Report, the Poor Law Board stated that they had considered it their duty to resist the disposition of the guardians to lower medical officers' salaries, and that from 1857 to the date of their report, thirty-two Unions had reduced the salaries of their medical officers by £1,514. It is, therefore, not a matter of surprise to find Dr. Griffin expressing the opinion that the inducement for Poor Law medical officers to continue in office are of too slight a nature, when no less than 899 resignations took place in the course of the three years previous to his writing.

Before entering into details to support the remainder of the propositions we have advanced respecting the benefits enjoyed under the present administration of medical relief and sanitary laws, it may be desirable to give an outline of the dispensary system in

operation in Ireland before 1851, so graphically described by Judge Longfield in his address on Social Economy at the meeting of the Social Science Association in Dublin. " This system was briefly as follows:—Any set of men, by subscribing funds for the purpose, might establish a dispensary in any part of the country they thought proper. The Grand Jury of the county was authorized to contribute to its support a sum equal to the subscriptions. The election of the medical officers and the management of the dispensary were left entirely to the subscribers."

" The imperfections of this system were obvious; but an inquiry into this system was directed in 1840, and a report made in 1841, disclosing, among other evils, the following state of things:—The number of dispensaries was insufficient, and their situation ill-chosen. The position and even the existence of a dispensary depended not upon the wants of the poorer but upon the subscriptions of the wealthier inhabitants. Accordingly, although in a rich district, the medical relief given to the poor might be sufficient, yet in a poor district there would be either no dispensary, or one extending over so large a district and so numerous a population, that the ill-paid officer attached to it must have been unable to discharge even a small proportion of his duties. In some cases relief was limited to those who should attend at the dispensary in person, or pay the doctor a small sum for calling on him. . . . . . . Sometimes the medical officer was non-resident, performing his duty by occasional visits to his dispensary. Sometimes the same officer had several dispensaries, ten or twelve miles distant from each other, under his charge. Sometimes he had no medical qualification. The subscribers paid no attention to the management of the dispensaries. The support of the medical officer depended upon his success in collecting subscriptions and keeping the subscribers in good humour; and, accordingly, whatever might become of the poor, he was sometimes obliged to give his services gratuitously to the subscribers themselves and their families, their horses, and their dogs. Sometimes the medical officer was permitted to retain all the subscriptions and Grand Jury allowance, out of which, however, he was obliged to pay all the medicines he prescribed. You may be sure that in those cases, the poor did not swallow much expensive physic. The salary of the medical officer was sometimes only £40, and sometimes less than £30 per annum."

A partial and imperfect system of medical relief, unattended with responsibility in its agents, and resting on a basis at once uncertain

in its duration, and unequal in its pressure as a tax, has been exchanged for a system uniform and universal, supported out of the poor rate, and influenced in its duration by well-defined responsibilities under the duration and control of a central authority. " Under the present system," Judge Longfield observed, " the dispensaries are independent of voluntary subscription, they are situated where they are most likely to be required, they are managed locally but subject to central control, which takes care that the influence of the rich shall not intercept for themselves the advantages intended for the poor."

We cannot but refer with gratification to the improved position and the high character of the medical gentlemen at present engaged under the Medical Charities Act, to their generally painstaking, zealous, humane, and conscientious discharge of their duties; under the present administration their professional status has been properly upheld, the qualifications required for office are of a high order, and there is an evident and, we hope, a growing desire on the part of the authorities to fix their salaries at a proper remunerative amount.

We believe the expenditure under the Act has not to the present time exceeded the anticipations of its promoters. We were in the House of Commons when the Medical Charities Bill was introduced by the Chief Secretary for Ireland, Sir William Somerville, the present Lord Athlumney; in the able and interesting statement he then made, he observed that it was calculated the expenditure under the proposed measure would not exceed twopence in the pound, and now, at the end of many years, the expenditure barely exceeds that sum, notwithstanding the improvements in the salaries of officers, the development of the system of medical relief, and the additional expenditure occasioned by epidemic disease.

Although not intending to enter into the question of expenditure,[a] we cannot here avoid remarking that the benefits of a well-organized system of medical relief are incalculable in restricting destitution and preventing ultimate pauperism; in affording to a

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[a] The following remarks appear in the course of Dr. Mapother's lectures on Public Health :—" A well directed sanitary organization is capable of saving, in Ireland, thousands of lives yearly, and of protecting very many thousands from pestilence and the pauperism and misery which follows in its wake." " It has been often shown that sanitary improvements lessen public expenditure by affecting not only people's health, but their prosperity and contentedness."

large class of well-deserving and industrious poor that immediate help and relief which prevents them from becoming inmates of a workhouse, or a burden on the rates of the union.

In the last reports of the operations under the Poor Law and Medical Charities Acts, we find that during the year ended the 30th September, 1865, there were 201,386 persons admitted to the workhouses; of these a large proportion were infirm and young people; 62,291 were admitted in sickness; 18,410 in fever, or other dangerous contagious diseases; 41,498 suffering under other diseases, and 2,383 from accidental injury. During the year the average daily number in the workhouses was 53,917, of whom the average daily number in hospital was 18,206, including a daily average of 1,824 fever, and 16,382 other patients. The total number of cases treated in the hospitals of workhouses, including the cases in them at the commencement and during the year, was 123,048, viz., 3,060 cases of accidental injury, 92,481 cases suffering under other diseases, 27,507 cases suffering from fever.

During the year ended the 31st December, 1865, 6,820 cases of ophthalmia were treated in the workhouse hospitals.

It further appears that in the year ended the 29th September, 1865, outdoor medical relief was afforded to 837,669 persons, of whom 635,336 were relieved at the dispensaries, and 202,333 were attended at their own homes on visiting tickets.

During the same period, the dispensary medical officers attended 6,632 cases of scarlatina, 2,000 cases of small-pox, and 26,566 cases of fever.

Under the provisions also of the Compulsory Vaccination Act, 172,099 children, including 2,957 in workhouses, were gratuitously vaccinated during the year ended the 31st December, 1865.[a]

[a] Since the above was placed in type, Mr. Gathorne Hardy, President of the Poor Law Board in England, when introducing, on the 8th February, the Metropolitan Poor Law Bill, stated that believing that half of the pauperism of the country begins with sickness, he instructed Mr. Lambert, an officer of the Poor Law Board, to inspect the dispensary system in Ireland; that he had made a report, upon which he proposes to establish, in the metropolis, a system calculated to diminish the amount of sickness. Mr. Hardy observed, " The advantages of this system are stated by Mr. Lambert in better words than I could employ," and read the following extracts from Mr. Lambert's Report :

" With regard to the general operation of the Dispensary Act, I find that Mr. Power, the Chief Commissioner, with whom I had the advantage of more than one conference on the subject, and the Poor Law Inspectors to whom he introduced me, are unanimously of opinion that it has proved to be universally beneficial, especially in all those large places where there is a resident apothecary acting as dispenser.

" Having stated the objections which have been made to the dispensary system, I now proceed to advert to some of the advantages derived from it.

The benefits derived from the valuable organization and machinery of the Poor Law and Medical Charities Act, in the prevention and mitigation of epidemic disease, are strikingly illustrated in some observations by the Commissioners in their last report, in which they refer to the successive and severe epidemics which visited this country at various periods, and show that from the arrangements then made, the confidence of the people was sustained by finding that the machinery for contending against the epidemic was in operation before they were aware that the disease was amongst them.

The Commissioners observe that the provisions of the Nuisance Removal and Diseases Prevention Acts of 1848 and 1849, were brought into active operation in the years 1853 and 1854, when the last serious invasion of cholera took place in Ireland. The first alarm on the subject was at the close of the year 1852; but the disease did not make its appearance as an epidemic until late in the Autumn of 1853. From that time until April, 1855, cholera prevailed occasionally as an epidemic in some places in Ireland, but the greater part of the country was free from the invasion.

During this period the organization of Dispensary Districts under the Medical Charities Act, which had been completed at the time

" 1. It insures for the destitute sick poor a sufficient supply of all necessary and proper medicines and medical appliances.

" 2. It enables those who are not confined within doors to obtain medical advice at fixed hours, and within a convenient distance from their homes.

" 3. It insures for those who are unable to go out, medical attendance, and enables them to obtain their medicines promptly.

" 4. It affords facilities for vaccination, as well as for medical relief generally, by establishing fixed places at which it is well known that the medical officers must attend at stated hours.

" 5. It provides an organization always ready, and capable of expansion if necessary, to meet any outbreak of epidemic disease with promptness, whilst at the same time it is calculated to prevent disease becoming epidemic by early treatment, and by procuring the adoption of precautionary measures in any locality which may be threatened. These benefits have recently been largely realized in Ireland in reference to cholera.

" 6. By preserving a record of the medical treatment in every case, it furnishes a test of both the skill and the attention of the medical officer.

" 7. It prevents that conflict between interest and duty which must so often arise in the mind of the medical officer when he himself is required to provide medicines out of his salary.

" I think it right to add, that after giving my best consideration to the system of dispensary relief, I am of opinion that it is admirably adapted to the exigencies of large and densely populated communities, and I do not hesitate, therefore, to recommend that it should form an element in any scheme for the improvement of Poor Law Administration in this metropolis, subject, however, to a restriction, such as I have indicated, with respect to the issuing of tickets for relief."

of the visitation, was applied with great success to the mitigation of the disease, and to the curative treatment of individuals attacked either by cholera or by premonitory symptoms, more especially the latter; and many thousands of such cases were so treated with success by the dispensary officers, as well as in the union hospitals, the whole number of cases having been about 40,000.

The result was that during the sixteen months of the presence of cholera in Ireland, a very small amount of mortality from that cause prevailed; the whole number of reported deaths from cholera and diarrhea together being 3,488, while in the London Metropolitan District alone the return of deaths from cholera for the fortnight ended 16th September, 1854, was 3,599. The expenditure on treatment for the same period amounted to only £4,377. In addition to this, however, the sum of £7,260 was expended by the guardians of Unions in the removal of nuisances during the two years; and this was exclusive of the sums expended for a like purpose by the municipal authorities in large towns, such as Dublin, Cork, Belfast, Limerick, and others.

When these very satisfactory results occurred under the operations of the acts, which had been so frequently pronounced to be defective, what may we not now reasonably expect, when we have in active operation the useful and extended provisions of the new sanitary act, under the administration of the Poor Law Commissioners.

As far back as the 27th July last, we find the Commissioners calling the attention of Boards of Guardians to the probability that the epidemic cholera, then prevailing in London, Liverpool, and other places in England, might extend to Ireland, and to the importance of taking timely measures of precaution; this was followed up by other communications on the 2nd, 7th, and 8th August.

On the 9th, 13th and 28th August, and 12th September, the Commissioners addressed each Board of Guardians respecting the new Sanitary Act, the course they intended taking in the event of cholera breaking out as an epidemic, and the powers conferred upon them and other local authorities, for enforcing sanitary regulations.

This Act has, by direction of the Poor Law Commissioners, been published in a pamphlet form, printed together with all the previous acts, or parts of acts, incorporated with or referred to in it, including certain portions of the Diseases Prevention Act of 1855, so far as the provisions were made applicable to Ireland. This book has been most extensively distributed, and its perusal affords evidence that

considerable care and trouble have been taken in its arrangement, and also, that much ability has been exercised to simplify what otherwise would have been complicated. It is likewise furnished with a copious and comprehensive index, which greatly facilitates reference to its varied contents.

In their circular letter of the 12th September, the Commissioners stated that this act contains the whole text of the sanitary laws at present in force in this country, arranged in the order which appeared to be most convenient for reference.

They pointed out that the various local authorities charged with the performance of public duties under these enactments have now each their several functions assigned with sufficient clearness, and that it is of the first importance that each should attend to the duty, for the right and full discharge of which it is made exclusively responsible.

The Local Authorities referred to are, in Ireland, only three— Town Councils, Town Commissioners, and Boards of Guardians. The two former, in all places where they exist, are made the nuisance authority and sewer authority for the district under their respective jurisdictions; in all other places the powers of the sewer authority, and those of the nuisance authority, are vested in the Board of Guardians of the Union in which such places are situate. The powers which relate to sewers and nuisances are both permanent, and demand a steady and continuous course of action from the several bodies to which they have been intrusted; and under the present law, not only the Town Council and Town Commissioners, but the Board of Guardians also, have the power of appointing and paying such Inspectors of Nuisances as may be required in their respective districts, the expenses incurred being payable from the Borough Fund, the Town-rate, or from the Poor-rates, as the case may be.

There are other functions of a like permanent nature arising under the " Public Health Act, 1848," " The Local Government Act, 1858," and the " Local Government Act, 1858, Amendment Act, 1861," the necessary extracts from which were given with the Act.

The Commissioners stated that these latter powers, like those under the Sewage Acts, and the Nuisances Acts, must be exercised in each locality by the Town Council, Town Commissioners, or Board of Guardians within whose jurisdiction, as sewage and nuisance authority, such locality may be situate. The boundaries of the respective

districts are well defined and notorious, so that no difficulty or confusion can arise in that respect; and each body intrusted with these several classes of permanent powers is expected to exercise them within its own district, and no other, and to provide for the expenditure incidental to its proceedings from the funds under its own control.

There is one class of powers created by these Acts which belong exclusively to the Boards of Guardians throughout the whole country, and which, in the absence of any direction to the contrary from the Lord Lieutenant in Privy Council, must be exercised by the Guardians of the Union alone, although the Union may contain places governed by Town Council or Town Commissioners. These are the temporary and occasional powers created by the issue of an Order in Council, under the Diseases Prevention Act, at a time when the country is visited or threatened by cholera, or any other form of fever or pestilence. These powers relate to the treatment of the sick, the interment of the dead, and other matters.

The Commissioners further pointed out that it is under the Diseases Prevention Act alone that they are called on to issue directions and regulations prescribing the mode in which the Guardians, Dispensary Committees, and Union Officers should severally act in executing such temporary powers. An order containing such regulations was then in force throughout Ireland, dated 25th August, 1866.

In their circular letter of the 9th August, the Commissioners recommended the extensive circulation throughout the country of the following useful notice :—

NOTICE.

To Householders and others in each Dispensary District.

To prevent the attack of Cholera, take every precaution to maintain the bodily powers in a healthful condition. Whatever strengthens those powers, lessens the risk of attack; whatever weakens them, adds to that risk.

1. FOOD AND DRINK.—Let the daily diet consist of wholesome solid food, bread, well-cooked oatmeal, Indian-meal, rice, good potatoes, or any fresh vegetable well cooked, which you know by experience will agree with you. Take fluids—whether they be tea, cocoa, coffee, new or skimmed milk, or pure water—in moderate quantities. Avoid the use of tainted meat, of stale

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fish—especially stale shell-fish,—of raw vegetables, of unripe or overripe fruit, and of acid drinks.

2. CLOTHING.—The clothing should be such as will keep the body comfortably warm. Wear a flannel band round the loins and bowels if the weather is damp or cold. Change damp or wet clothes, and keep the feet dry and warm.

3. AIR.—Pure air is not less essential to health than wholesome food. Maintain, therefore, carefully, in every inhabited apartment a free change of air; as free, day and night, as is consistent with preserving sufficient warmth and excluding wet. The greater the number of inmates in any room, the more free should be the current of air maintained in it. Beds should be freely exposed to the air during the day. Free ventilation greatly diminishes the risk of contagion from cholera. Though this disease is, with good reason, believed to be contagious, it is certainly much less so than others with which we are familiar,—as typhus fever, scarlatina, and small-pox; and free ventilation, by diluting the effluvia, greatly weakens their power of communicating the disease. Attendance in the room, where a patient lies ill of cholera, of persons not in necessary care of the sick, and wakes of persons who have died of it, are certain means of spreading the disease.

4. CLEANLINESS.—Personal and domestic, is of the highest importance. Pay strict attention, therefore, to cleanliness of clothes and person. Remove to a distance from your dwellings, and do not suffer the re-accumulation of stagnant water, dung, any rotting vegetable or animal matter, or other filth. On the discovery of any offensive smell, ascertain the cause, and remove it. White-washing dwelling and out-houses, with whitewash freshly made with freshly-burned lime, is to be recommended. The compulsory removal of any filth which your neighbours refuse or neglect to remove, can be speedily procured by two householders giving notice in writing to the Board of Guardians of the existence of such nuisance, and specifying the premises on which it is to be found. On the removal of any very offensive matter, chloride of lime or peat charcoal should be liberally mixed with it, and after its removal the place where it lay should be liberally dusted with one of those substances, or sprinkled with a solution of chloride of lime, in the proportion of about $\frac{1}{4}$lb. of chloride to a gallon of water. During the whole of the epidemic in London in 1849, not a single case of cholera occurred in any one of the model dwellings of the

poor, though the disease raged in the districts in which these buildings are situated; and there were instances of two, and even four, deaths in single houses close to their walls.

5. TEMPERANCE.—Avoid excess either in eating or drinking. Excess in the use of spirituous liquors is especially dangerous. Intoxication, where cholera is prevalent, is frequently followed by an attack of the disease.

6. EXERCISE.—Moderate exertion of body or mind strengthens. Fatigue, long fasts, watching—all habits that occasion debility,—exhaust the powers of life, and predispose to the attack of cholera.

7. PURGATIVES.—No purgative medicine should be taken during prevalence of cholera, without medical advice.

On the 28th August, the Commissioners forwarded an Order under their Seal, setting forth certain regulations to be observed under the Order in Council of the 17th August, whereby the provisions of " The Diseases Prevention Act, 1855," were put in force throughout Ireland for a period of six months.

They stated that the several objects for which they were authorized to issue such directions and regulations " Were for the speedy interment of the dead: for house to house visitation; for the dispensing of medicines, guarding against the spread of disease, and affording to persons afflicted by or threatened with such epidemic, endemic, or contagious diseases, such medical aid and such accommodation as may be required."

Certain parts of Ireland having been declared, by the Order in Council, to be affected by or threatened with cholera, the regulations in the Order necessarily fell under two different heads, one of which was applicable to Unions not yet visited by the disease, and the other to Unions in which cholera was known to be prevailing.

To the first class of Unions, under the head entitled " *Preliminary*," the first only of the sixteen regulations mentioned in the Order, applied, requiring the Guardians, at their first meeting after the receipt of the Order, to make all the necessary arrangements beforehand, which might enable the remaining provisions to be carried into effect at once, on the actual appearance of cholera in the Union.

Already these arrangements, so far as they regarded the provision of hospital accommodation to be used on the possible appearance of

cholera, had been taken into consideration by most of the Boards of Guardians in Ireland, in pursuance of circulars issued from the Commissioners' Department; and the Commissioners further observed that as the Unions, with very few exceptions, were each provided with an hospital for the reception and treatment of dangerous contagious disease, the additional accommodation likely to be wanted would not probably be considered, in the first instance, to be very extensive. The ultimate extent would, of course, depend upon the progress of the disease, if it should unfortunately break out.

The Commissioners also pointed that a very small proportion of the fever hospital accommodation being then occupied by fever patients, it would be a great protection to the inhabitants of the central town of the Union, and to the inmates of the workhouse itself, if a ward on each side of the detached building used for fever patients, were appropriated to the reception of cholera patients, brought either from the workhouse or from elsewhere; but in no case should cholera patients be introduced into the same wards where patients suffering from other diseases were under treatment, or into parts of the building occupied by healthy inmates. Within the workhouse itself, however, it would be found most useful to set apart one or more rooms for the separate treatment of inmates who are known to be affected with diarrhea, such patients being required to keep their beds until perfectly recovered; or, on the case passing into cholera, to be removed, if practicable and with safety, to the cholera wards in the Fever Hospital.

They further observed that, so far as relates to the " dispensing of medical aid," the Guardians would find that the present regulations differ but little from those of 1854, the Poor Law Unions and dispensary districts affording, as then, an organization which is very readily adapted, with some modifications, to the prevention of the spread of cholera, and to the effectual treatment of that disease, and especially of the premonitory symptoms which usually precede its attacks on individuals, the proper treatment of which in time has the effect of preventing its further development.

Under the Medical Charities Act, medical relief is obtainable only for the poor by means of tickets, signed by certain authorized persons; but by Paragraph V. of the Order, the entire population, in places where cholera prevails, is at once entitled to medical advice and medicine, free of charge, in every case of complaint of the bowels.

There are, however, in the recent Act—" The Sanitary Act,

1866"—some new powers conferred on Boards of Guardians, the exercise of some of which is regulated by certain provisions of the order.

The first of these is the new power given for the purpose of disinfecting infected clothing, bedding, and other articles. Where the ordinary disinfectants are not sufficient, and the use of great heat is necessary to disinfect such articles thoroughly, the Guardians are authorized by this paragraph to incur the expense of a hot-air room, with the proper apparatus and attendance, to disinfect by heat any articles brought for the purpose, free of charge.

By the second branch of the same regulation the Guardians are required to provide for persons afflicted by, " *or threatened with cholera,*" all such medical aid and such accommodation as may be required. These are the words of the Diseases Prevention Act; and it is observable that in the regulations issued by the Lords of the Privy Council in England, they are distinctly construed as including a power to provide accommodation for the friends of persons who have suffered cholera, so as to enable healthy occupants of infected houses to be removed to a temporary place of refuge until the premises have been thoroughly purified and disinfected.

In virtue of these provisions the Commissioners stated that they understood that, in the parish of Liverpool, a house of refuge was provided for such parties at the expense of the poor rates.

The third branch of the regulation relates to the establishment of a system of visitation from house to house, to be conducted by a staff of qualified practitioners and assistants.

As the operations required by this paragraph may be so carried out as to involve considerable expense, the Guardians were informed that these several requirements are limited to the case where cholera has been certified to prevail as an epidemic. The Guardians, however, possess the power to exercise the same functions under all circumstances during the time for which the Order in Council continues in force.

The Commissioners having stated that " The Sanitary Act, 1866," conferred upon them other powers which would be the subject of further communication, they thought it right, however, at once to apprise the Guardians that they had authority, complete and permanent, to appoint and pay from the poor rates one or more sanitary inspectors or inspectors of nuisances, for those portions of the union which are under their jurisdiction as the nuisance authority.

The following are the principal passages appearing in the order of the 25th August referred to. Their importance will justify their insertion, together with the form of notice alluded to in the order.

Under the first head,

Preliminary.—That the Guardians of the Union shall, at their first weekly meeting after the receipt of this order, make such preliminary arrangements as may, if sudden need shall arise, enable the regulations to be carried into immediate effect; and shall take steps to secure possession of such buildings or apartments as may be used, if necessary, as cholera hospitals.

Under the second head,

When Cholera is in a Union.—The Commissioners directed the formation of sanitary committees, and that the medical officers, relieving officers, and wardens within each district should aid the Guardians of the Union.

That the medical officers of the several dispensary districts shall receive extra remuneration for their attendance on cholera patients, and that every such medical officer shall give immediate attendance and medicine to all persons within his district complaining of diarrhea, looseness of bowels, or cholera, without requiring the production of a ticket for medical relief or attendance; and shall give daily attendance at the dispensary of the district at such hours as the committee shall direct.

That each sanitary committee shall hold a meeting once in each week, on the day before the meeting of the Board of Guardians; and an extraordinary meeting may be convened, in case of emergency, on any other day, by the medical officer of the district, or certain members of committee.

That every medical officer shall lay before the sanitary committee of the district, at each weekly meeting thereof, a statement showing in the separate columns the number of cases treated by him during the preceding week, with the result thereof. This return to be forthwith communicated by the sanitary committee to the Guardians of the Union, and the Clerk to the Guardians shall forthwith transmit to the Commissioners a summary of such returns. The medical officers are also required to make to the Commissioners a daily return of the cases of diarrhea and cholera occurring in their districts.

The Board of Guardians are required to post up in all public places throughout the union a notice stating the situation of the dispensary, the name and residence of the medical officer or officers

thereof, and recommending all persons to obtain medical advice who may be affected.

The Board of Guardians of the Union, and the sanitary committee of each dispensary district, in which any poor persons may be attacked with diarrhea or cholera, are required to cause the dwellings in which such persons may have been seized with disease to be thoroughly cleansed, purified, and disinfected, and all nuisances to be removed therefrom, and if necessary at the charge of the rates of the electoral division in which the dwellings may be situated.

In every dispensary district in which cholera shall be certified by the medical officers to prevail as an epidemic, the Guardians of the Union containing such district shall, for the purpose of thoroughly disinfecting clothes, bedding, or other things requiring a process of disinfection by means of heat, provide a proper chamber, with suitable apparatus, to which the relatives of all persons who have suffered from cholera may bring such clothes, bedding, or other things, for the purpose of being so disinfected; and in every such district the Guardians shall provide such medical aid and such accommdation for persons afflicted by or threatened with cholera as may be required; and shall likewise provide for the visitation from house to house of the inhabitants of such district, by employing and providing with all requisite medicines a sufficient number of qualified medical practitioners and assistants to make such visitation daily in the district, and to supply remedies to persons found to be suffering from cholera or diarrhea, as the case may be.

In the event of the fatal termination of any case of cholera in the dwelling of any poor person, the body of the deceased person shall be removed for interment as speedily as may be; and if, from the poverty of the occupiers of any such dwelling, they should be unable to provide for such interment, the Board of Guardians are authorized to defray the expense necessarily incurred for this purpose, and to charge the same on the Rates of the Electoral Division.

If any Board of Guardians shall be informed that cholera or choleraic diarrhea exists, or within three days previously has existed, in any ship or vessel, not belonging to Her Majesty or any foreign Government, which may be lying within their Union, they shall cause the same to be forthwith visited, inspected, and otherwise dealt with, according to the circumstances of the case, as if it were an inhabited house on shore, and shall give all such medical and other directions in reference to the persons in such vessel or

ship as shall be requisite for preventing the spread of the disease, and for the disinfection or disposal of any things which may be infected or may have been exposed to infection, subject always to the provisions of any order of Council issued under the quarantine laws for the time being in force within such Union.

The Poor Law Commissioners in this order authorized and required the Board of Guardians of each Union to do all acts, matters, and things necessary for superintending and carrying into execution the directions and regulations made by their Form of Notice.[a]

In addition to the foregoing instructions the Commissioners, on the 5th December last, addressed the Guardians of each Union on the importance of making permanent appointments of Inspectors of Nuisances or Sanitary Inspectors. They pointed out that the provisions of the Sanitary Act are not directed against cholera alone, but against every description of dangerous contagious disease, especially the more fatal kinds of fever, which, although not then epidemic, are always prevailing more or less in the country with fatal effects, and may at any time become epidemic.

These diseases are promoted in the same way as cholera, by the impurity of the air, more especially of that within the dwelling-house, and by the use of impure water, unwholesome food, and other like causes.

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[a] PUBLIC NOTICE.—— ——Dispensary District. The Dispensary situate at——, is open, and the Medical Officer attends thereat, from——o'clock to——o'clock, daily. The Medical Officer may also be consulted at his own residence daily, from—— o'clock to ——o'clock.

The residence of ——the Medical Officer, is at——.

If any person be attacked by *diarrhea or looseness of bowels*, however slight, *whether with or without pain*, let him apply WITHOUT A MOMENT'S DELAY (*no ticket or recommendation being necessary*) at the Dispensary, or at the Medical Officer's residence, as above stated, where medical relief will be given with the least possible delay : but,

In case medical advice be not at hand—or if in addition to looseness of bowels or diarrhea, any person be attacked with vomiting, cramps, or great weakness—let him go at once to bed, wrap himself in warm blankets, roll a swathe of warm flannel, sprinkled with hot spirits of turpentine or whiskey, closely round the body, extending from the chest to the hips, and take a teaspoonful of brandy or whiskey in a little water, with fifteen drops of laudanum, repeating it every hour if the attack be not checked, until a third dose has been taken. He ought not to venture further in the use of laudanum without medical advice.

If any person be affected with vomiting, purging, or cramps, and in consequence be unable to go out, let him direct some person to apply—either at the Dispensary, if within the hours above named for attendance at the Dispensary—or at the Medical Officer's residence, if at any other time, or when the Dispensary is not open ; giving the name and residence of the patient, and requesting an immediate visit from the Medical Officer.

The Commissioners remarked that the removal of nuisances, the maintenance of proper drainage, the supply of pure water to the population of towns and villages, and the prevention of over-crowding in dwelling-houses, are objects which the Legislature has determined shall henceforward be continuously carried out for the security of the public health, and has, therefore, created permanent powers and imposed permanent responsibilities for that purpose; and there is no Union in Ireland in which, henceforth, it will not be necessary for the Guardians to employ at all times one or more Inspectors of Nuisances, in order to enable them to carry out con-tinuously and permanently these objects of the Legislature.

The office of Inspector of Nuisances will necessarily vary much as to the extent of its duties, and the amount of remuneration for their performance according to the circumstances of the district. In some cases it may be proper to employ a person devoting himself wholly to the office; in other cases, especially in rural districts, Relieving Officers, or other Officers under the control of the Guardians, can be invested with the duties; but in the opinion of the Commissioners all territory which is within the district of the Guardians, as a sewer or nuisance authority, should be under some person having authority to act as an Inspector of Nuisances, and responsible for reporting to the Guardians every case requiring any exercise of their powers either as sewer or nuisance authority.

There are many clauses in this useful Act worthy of being more prominently noticed, respecting the extension of quarantine laws to coasting vessels in the United Kingdom, and the extension of the jurisdiction of nuisance authorities to ships. The important powers entrusted to the Poor Law Commissioners, of inquiring into public health; the disinfection of houses, clothes, and carriages; carriage of persons suffering under infectious diseases in public conveyances; provision of places for the reception of the dead; power of cleansing and covering open ditches. Sale of unwholesome meat, noxious trades and manufactures, overcrowding of dwellings; regulation of lodging-houses and cellars; removal of manure in stables and mews. Baths and wash-houses, sewerage, power of sewage authorities to construct waterworks, and supply water to towns and villages, and for baths, trading and manufacturing purposes.

Many of these enactments are in full operation, and the benefits to be derived from others depend upon the views taken by the local authorities and officers of their duties and responsibilities. If the representatives of the rate-payers, at Boards of Guardians and

Corporations, do not carry into effect their important trusts, the remedy is in the hands of their constituents, who have been wisely allowed the opportunity of periodically returning them. To the rate-payers of this country the largest amount of representation, responsibility, and freedom has been confided.

Although ardent and enthusiastic sanitary reformers have desired that the unlimited powers and jurisdiction of a Haussmann should be placed in the hands of the central authority, they should remember that the highest authority—John Stewart Mill—has laid down, in his celebrated Essay on Liberty, that " to secure as much of the advantages of centralized power and intelligence as can be had without turning into governmental channels, too great a proportion of the general activity, is one of the most difficult and complicated questions in the art of government." He believes that the practical principle in which safety resides, may be conveyed in these words:— " The greatest dissemination of power consistent with efficiency ; but the greatest possible centralization of information, and diffusion of it from the centre." He adds that the central organ should know all that is done, and its special duty should be that of making the knowledge acquired in one place available for others. Emancipated from the petty prejudices and narrow views of a locality by its elevated position and comprehensive sphere of observation, its advice would naturally carry much authority; but its actual power should, he conceives, be limited to compelling the local officers to obey the laws laid down for their guidance. For the violation of rules, they should be responsible to law, and the rules themselves should be laid down by the Legislature; the central administrative authority only watching over their execution; and if they were not properly carried into effect, appealing, according to the nature of the case, to the tribunals to enforce the law, or to the constituencies, to dismiss the functionaries who had not executed it according to its spirit. " Such, in its general conception, is the central superintendence which the Poor Law Board is intended to exercise over the administrators of the poor-rate throughout the country." " A government cannot have too much of the kind of activity which does not impede, but aids and stimulates individual exertion and development. The mischief begins when, instead of calling forth the activity and powers of individuals and bodies, it substitutes its own activity for theirs ; when instead of informing, advising, and, upon occasion, denouncing, it makes them work in fetters, or bids them stand aside and does their work instead of them."

PART III.

MEDICAL MISCELLANY.

Reports, Retrospects, and Scientific Intelligence.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE KING AND QUEEN'S COLLEGE OF PHYSICIANS.

Special meetings of this society were held on 27th March, and 4th and 5th April, to receive and consider reports from the hospitals in which cases of cholera were received during the late epidemic.

ABSTRACT OF REPORTS ON THE LATE EPIDEMIC OF CHOLERA.

MEATH HOSPITAL.

Short Abstract of Facts Connected with the Epidemic of Cholera. By GEORGE ROE CARTER, late Resident Pupil. (On the part of himself and other Assistants).

1. *Time occupied.*—The first patient was admitted on the 8th of August into the cholera wards of the Meath Hospital, between which date and the 14th of October 116 patients were admitted, all of whom were under the supervision of Dr. Hudson. An interval of about six weeks occurred between the closing of the wards on the 20th of October, and opening of the sheds, which were opened on the 1st of December, and closed on the 28th of the same month; during that time fourteen cases were admitted into the sheds, and treated according to Dr. Stokes' directions.

2. *Accommodation provided.*—The wards of the Meath Hospital for the reception of such cases were first opened under very unfavourable circumstances, which, no doubt, is well known to a great number of the profession, inasmuch as they were quite inadequate in size, situation, ventilation, and other common necessaries, which are of such vital importance, not only for the welfare of the patients, but even for the attendants.

The cubic space of the wards are as follows : —

Female ward, 3,432 feet ; male ward, 4,302 ; they contained six beds each, which only allows 572 cubic feet for each female patient, and 717 for each male, giving an average of $644\frac{1}{2}$ cubic feet for each, without any current of air. The sheds which were erected are in every respect well adapted for the requirements of such patients.

3. *Stage of disease on admission.*—Out of the 116 cases admitted into the above named wards which were treated by Dr. Hudson—five were in the premonitory stage, 108 in collapse or approaching it, and three in consecutive fever ; of the fourteen cases which were admitted into the sheds and treated by Dr. Stokes, three were in the premonitory stage, nine collapse, or approaching it, and two in consecutive fever.

4. *Mortality at different periods and different ages.*—From the 8th August to the 1st of September the mortality was 48·9 per cent., and from the latter date to the 20th October raised to 54·5 (the increase of which we consider was due to the overcrowding of the wards), and to the condition of the patients on admission, as the earlier cases were more amenable to treatment, while, as the epidemic advanced, the disease assumed a more malignant type, which was probably aggravated by the crowding in our small wards.   In December, on opening our large and airy sheds, it went down again to 42·8 per cent., averaging on the whole 51·5 per cent. Over twenty of those patients died within five hours after admission, some in a quarter of an hour, others in from half an hour to two hours. The mortality in children and adults was much under that of the aged, and particularly those whose constitution had been broken down by dissipation, few, if any of them, recovered.

5. *Modes of treatment pursued, varied according to the stage, as follows:—*

(*a.*) In premonitory diarrhea and early stage, in two cases castor oil was given, but with discouraging results. Acetate of lead with small quantity of opium, sulphuric acid, and chalk mixture, with kino and catechu succeeded in a number of instances ; the vomiting was checked in some cases by freshly prepared charcoal, in a few by bisulphite of soda, but with most effect by creosote and acetic acid, which was subsequently prescribed by Dr. Stokes. We also found a solution of camphor and chloroform useful in cramps of the stomach, particularly so when combined with capsicum, and the inhalation of chloroform most effectual in allaying cramps in some bad cases ; in addition to those internal remedies, hot stupes of mustard and turpentine were applied, and friction of the surface and extremities with the hands ; flannel bandages being applied after friction. Brandy was given freely, and ice *ad libitum*, the latter of which was of much use in allaying thirst and checking vomiting.

(*b.*) In collapse or approaching it, the patient was enveloped in a blanket wrung out of hot water and mustard, and sprinkled with turpentine, over which a number of dry ones were put, removed when it got

cool, and repeated if necessary; this we found to be most efficacious in rousing the patient and raising the temperature of the body, after which mode of packing the radial pulse, which was before it imperceptible, invariably returned, and the patient expressed himself as being much better. We have also tried, with some advantage, Sir D. Corrigan's button-shaped cautery, heated by boiling water, and applied over the vagus, and on either side of the spine, which would arouse the patient greatly for the time, though he frequently relapsed into his former condition. In addition to those external applications, calomel and bismuth from gr. $\frac{1}{4}$ to $\frac{1}{2}$ gr. of the former, to gr. v. of the latter were given every hour, until the secretion of bile and urine was restored; the dose of calomel was subsequently increased (to gr. v. followed by one grain every hour) by Dr. Stokes, also with good results; camphor and chloroform, and the inhalation of chloroform were also employed in this stage of the disease for the relief of cramps. At the suggestion of Dr. White tinct. of canabis indica was extensively tried (in 20 to 30 drop doses) as a stimulant, in some cases with apparent benefit; brandy was freely given also in this stage of the disease. Seven cases were treated by calabar-bean at the request of Dr. Mapother, which Dr. Mapother reported in *The Medical Press and Circular* of the 12th of September; in these seven cases three proved fatal, and with one or two of those who survived we were obliged to discontinue the use of the drug, and put them on calomel, on which treatment they speedily recovered. In some of those cases it produced dysenteric stools, and contraction of the pupil with the cornea slightly injected. (As the number of cases treated by the drug were insufficient to test its value in this disease, we cannot either condemn or recommend its use; but we are of opinion that the results from its more extensive trial would not have been so favourable as those of the calomel treatment). Two cases were treated by Dr. Stokes, by the injection of salines into the veins, which proved fatal (but as they were previously treated by calomel, and the number not sufficient to test its value, we cannot say anything in favour of it or otherwise).

Stage of suppression of urine, and consecutive fever.—(*c.*) For suppression of urine the patient was cupped over the lumbar region, and 3 or 4 ℥ removed, after which a hot bran poultice was applied to the feet, and diuretics administered. In several instances the cupping was repeated with great advantage, and we have succeeded in bringing on the flow of urine in a good many cases, when complete suppression of that secretion had existed for over forty-eight hours, and even from patients who were far advanced in uremia by those measures; calomel and bismuth was also given in this stage of the disease as before, but stimulants were not administered so freely. In the consecutive fever, if the evacuations from the bowels were bilious and copious, the calomel was either discontinued

altogether or given in small doses at long intervals; if the pulse was strong and regular, tongue moist and rather clean, no gastric irritation or delirium, the patient got a moderate quantity of brandy or wine, chicken broth or weak beef-tea, bread and milk or tea and ice *ad libitum*. In the advanced stage of uremia, when head symptoms were present, the characteristic odour from the patient, with complete suppression of urine, we have seen the best results follow, repeated cupping over the loins with the administration of diuretics, the shaving of the head and blistering the nape of the neck, and the application of leeches to each mastoid process, with a calomel and rhubarb purge when there was no motion of the bowels for a few days. Such were the modes of treatment adopted during the late epidemic by Dr. Stokes and Dr. Hudson, and if time or space would admit, we could bring forward a number of important cases which were successfully treated. During the whole epidemic only two cases occurred in the hospital, which was in the interval when no cholera cases were in the wards, or had been for ten days previous. One of those patients was convalescent from typhoid, and died in nine hours' illness, the other was in the thirteenth day of typhus, with high nervous symptoms, and died in about twelve hours' illness. The night nurse and washerwoman attending on the cholera wards were attacked; the former made a wonderful recovery, but the latter died in less than twenty-four hours' illness. We also had a case associated with pregnancy, who was admitted in a very precarious state ; the woman was six months pregnant. The treatment as in other cases was adopted, and the patient left hospital perfectly well, without any sign of abortion.

HOUSE OF INDUSTRY HOSPITAL.

Summary Report on the Cases of Cholera Admitted to the Hardwicke Hospital, 1866. Collated by Mr. J. ADAMS CLARKE, Clinical Clerk. Edited by DR. LYONS.

During this epidemic a total of 277 cases were admitted into the cholera wards, and no case of cholera was refused admission ; several were admitted which had failed to procure admission elsewhere. From these cases were rigidly excluded, by the clinical physicians, all instances of vomiting and purging, with or without cramps, which did not strictly correspond to the true type of Asiatic cholera.   There were thus recorded of

True cholera, .	.	193	cases, of whom		128	died.
Diarrhea,	. .	68	,, ,, ,,		1	,,
Vomiting and cramps,		16	,, ,, ,,	None		,,
		277			129	

Of diarrhea, including choleraic diarrhea, 68 cases were admitted, of

which the first was taken in on June 25th, and the last on December 3rd. Occurring during the prevalence of a cholera epidemic, these cases, it is highly probable, belonged to the epidemic constitution then prevailing; only one case proved fatal. It occurred in the person of a man, aged forty-five, who was admitted on the 6th of August, and died on the 10th. Prior to the 25th June no case of diarrhea had been admitted into the Hardwicke Hospital for a period of six months.

Cholera.—Of undoubted cases of true cholera 193 were admitted, of whom 128 died. The first case occurred in the person of a girl aged seven (Susan Carleton), who was admitted on the 22nd of August: she had lived in Church-street, 127; she died on the 23rd of August. The last case of death from cholera occurred on the 5th December, 1866; but the last case of cholera disposed of in hospital was discharged cured on the 28th December, 1866.

The following table exhibits the actual number of cholera cases by sexes and ages :—

Admissions by ages			Under					Over	Total	Deaths
	5	10	20	40	50	60	60			
Males	7	9	17	26	11	3	7	80	48	
Females	6	9	19	41	12	13	13	113	80	
Totals	13	18	36	67	23	16	20	193	128	

Last case discharged cured 28th December, 1866.

The largest number of admissions occurred during week ending 27th October—11 males, 12 females; total, 23.

The largest number of deaths during the same week (27th October)—4 males, 11 females; total, 15.

The geographical distribution of the above cases was as follows :—

From N. side of Dublin, - - 85, *i.e.,* north of the Liffey.
From S. ,, ,, - - 105, *i.e.,* south of the Liffey.
From Arklow, Wicklow (Dublin Bay), - - - - - 1
From Kingstown, Co. Dublin, - 1
From Westport, Co. Mayo, - 1, (Guard in M. G. W. Railway got ill on way).

Total, - - 193

The admissions per month were as follows :—

	July	Aug.	Sep.	Oct.	Nov.	Dec.
Males	1	10_8	21_{14}	24_{15}	21_{13}	3_1
Females	–	11_6	24_{14}	39_{29}	33_{24}	6_4
Totals,	1	$21_{(14)}$	$45_{(28)}$	$63_{(44)}$	$54_{(37)}$	(9_5)

Total, 193.
(Deaths, 128.)

N.B.—The small figures indicate the deaths.

Diarrhea, including choleraic diarrhea—Total, 68, including 1 death.

<div align="center">First case admitted June 25th.
Last   ,,   ,,   Dec. 3rd.</div>

The next table exhibits the mortality for sexes and ages respectively:—

Deaths for ages	Under						Over	Total.
	5	10	20	40	50	60	60	
Males - - -	4	6	8	15	10	2	7	52
Females - - -	4	7	7	25	11	10	12	76

The excessive mortality of females of the ages of 40, 60, and upwards, at once strikes the eye.

In the subjoined table will be found the per centage mortality of the sexes, ages, and for the months of the epidemic :—

<div align="center">TABLE OF PERCENTAGE MORTALITY.</div>

The percentage mortality in the total of true cholera cases was 66·3 per cent.

For males the mortality was   -   -   -   -   -   -   - 60·   ,,
For females   ,,   ,,   -   -   -   -   -   - 70·8   ,,

<div align="center">FOR THE SEVERAL MONTHS THE PERCENTAGE MORTALITY WAS :</div>

Aug.	Sept.	Oct.	Nov.	Dec.
66·6	62·2	69·84	68·5	55·5

<div align="center">FOR THE SEVERAL AGES AND SEXES THE PERCENTAGE MORTALITY WAS :</div>

Deaths for ages	Under						Over.
	5	10	20	40	50	60	60
Males - -	57·14	66·6	47·	57·69	90·9	66·6	100·
Females - -	66·6	77·8	36·4	60·9	91·66	76·9	92·3

Subjoined is a tabular view of the duration of the fatal cases in hours prior to their admission to hospital :—

<div align="center">FATAL CASES—DURATION OF DISEASE BEFORE ADMISSION TO HOSPITAL.</div>

Admitted dead	Under 1 hour	Under 2 hours	Under 3 hours	Under 6 hours	Under 12 hours	Under 24 hours	Under 48 hours	Under 72 hours	Under 96 hours	Under 5 days	Over 5 days	Not known
1	2	3	3	16	38	22	12	5	7	5	8	6

<div align="center">128</div>

The next summary shows the duration in hours of the fatal cases in hospital :—

<div align="center">FATAL CASES—DURATION OF DISEASE IN HOSPITAL.</div>

Brought in dead.	Under 1 hour	Under 2 hours	Under 3 hours	Under 6 hours	Under 12 hours	Under 24 hours	Under 36 hours	Under 48 hours	Under 72 hours	Under 96 hours	Under 10 days
1	1	2	2	6	28	50	3	13	7	4	10

<div align="center">90 died within 24 hours.   16 died within 48 hours.</div>

<div align="center">Total 128 deaths.</div>

We annex a summary of the results of various plans of treatment by :—

		Deaths.	Recoveries
Emetics - . - . .		—	—
Purgatives - . - . . .		—	2
Astringents { lead and opium - . . .		—	—
catechu, &c.		15	18
chalk, &c.		—	—
Calomel, - . - . . .		31	16
By stimulants { chl. ether, sp. am. - . .		40	13
brandy, &c.		—	—
Without stimulants -		—	1
By special treatment—as white of egg . .		8	2
Calabar bean -		—	1
Camphor and chloroform		11	3
Camphor, capsicum, and creosote . . .		8	4
Warm bath -		—	1
With milk -		—	—
Diuretics -		—	1
No entry -		13	13
Permanganate of potash		1	—
Ice, brandy, &c.		1	—
	Total -	128	75

As to treatment it is to be observed that none of a special character was exclusively adopted; and each case was dealt with according to the symptoms which were predominant. A very large number of the cases were, as already stated, in collapse on admission, or passed into that stage almost immediately, 90 deaths out of 120 having occurred within 24 hours after admission to hospital. In this condition the means employed were those calculated to restore the circulation—free stimulation, friction to the surface with the hand or with warm flannels—hot stupes, with or without mustard, turpentine, &c.—hot dry flannels were wrapped round the body. Amongst other stimulants, camphor dissolved in chloroform was freely given, also a pill containing camphor, capsicum, and creosote. Stimulants of an alcoholic nature were given largely diluted. Cold drinks were given without any restriction when the patient desired them; in one instance the patient would take nothing but scalding hot water; white of egg dissolved in water, one egg to the pint, was given as a bland and agreeable drink; ice was freely supplied. In about 33 cases astringents were the medicines chiefly employed, besides the general measures before stated. Of these the deaths were 15 to 18 recoveries. In about 47 cases calomel in small doses was given as the principal remedial agent, and of these 31 died and 16 recovered. Liniments of turpentine and chloroform, and also of belladonna and aconite were largely used, and were found effectual in allaying cramps. Secondary fever occurred in a certain proportion of cases only, marked

by suppression or diminished secretion of urine. In several of these cases nitre, calomel, dry cupping to the loins, the prolonged use of the warm bath, and diuretics were found of essential service.[a]

The following is a brief summary of the *post mortem* appearances :—

GENERAL SUMMARY OF POST MORTEM APPEARANCES.

1. Body generally—Rigor well-marked; lividity diminished; temperature raised, as compared with that before death.
2. Brain—Healthy.
3. Spinal Chord—Healthy.
4. Ganglionic centres (solar plexus and semilunar ganglia)—Healthy.
5. Blood—Thick and tarry.
6. Heart—Right chambers loaded; pulmonary artery contained coagulum.
7. Lungs—Occasional congestion; no constant condition.
8. Stomach—a washed appearance; but varied with ingesta, taken in before death.
9. Intestines—A general washed appearance; pale pink colour; sago-grain appearance of minute glands.
10. Liver—No marked appearance noticeable.
11. Spleen—No special characters.
12. Kidneys—Rather bloodless; and in cases of prolonged life with uremia, some congestion with infarction of tubules.

There were 26 persons, 4 males and 22 females, employed in the Hardwicke Hospital during the cholera period; 4 nurses and 2 ward-maids were in constant attendance on the cholera patients; all the others were in close proximity, and frequently assisted in carrying in patients, &c.; 5, exclusive of the laundry-superintendent, were constantly engaged in washing the clothes of the cholera patients; of all of them, but one, a laundry-maid, took cholera, and she died of it. She was some hours ill with cholera in the sleeping room of the laundry-maids, who were all in close attendance upon her; 4 physicians, 4 clinical clerks, 2 temporary do., and a class averaging 20 per day were in daily attendance; one clinical clerk (Mr. Henry) exhibited cholera, but recovered. In all—4 physicians; 4 clinical clerks; 3 temporary do.; 1 steward and pay-master; 1 registrar and accountant; 20 pupils (at a minimum); 26 domestics and superintendents; 1 diet clerk.—Total, 60.

These persons were exposed to the full influence of the disease, of whom two only exhibited it, and one of whom only died.

The cholera wards of the Hardwicke Hospital are two of the ordinary fever wards; they are under the same roof as the other wards, and all the wards open upon a common well-stair-case and central hall, and it is impossible to conceive that in changing and varying winds admixture of the atmosphere of the cholera wards with that of the other wards did not frequently take place.

[a] This paragraph has been supplied by Dr. Lyons for the present publication.

The fever wards were occupied by ordinary cases during the cholera period to the total number of 428; of these five patients only exhibited cholera.

I. FEVER PATIENTS IN HARDWICKE DURING CHOLERA EPIDEMIC, FROM JULY 26TH TO DECEMBER 16TH, 1866.

July	26th to 31st,	-	-	-	-	-	10	patients.
August	1st ,, 31st,	-	-	-	-	-	92	,,
Sept.	1st ,, 30th,	-	-	-	-	-	81	,,
Oct.	1st ,, 31st,	-	-	-	-	-	107	,,
Nov.	1st ,, 30th,	-	-	-	-	-	67	,,
Dec.	1st ,, 28th,[a]	-	-	-	-	-	71	,,

Total 428 patients.

This total number of 428 includes simple typhus and typhoid fever, small-pox, scarlatina, and measles.

II. FEVER PATIENTS WHO TOOK CHOLERA IN THE HOUSE.

1. *Edward Corcoran,* admitted with fever, 26th July; got cholera August 30, 1866.
2. *Thomas Berry,* admitted with fever 28th August; got cholera.
3. *Ellen Brennan,* admitted with fever 9th October; got cholera.
4. *Mary M'Mahon,* admitted with fever 10th October; got cholera.
5. *Margaret Leary,* admitted with fever 20th October; got cholera.

Died.

Summary.—Total fever, &c., cases in Hardwicke during the period commencing July 26th and ending December 28th - - - - - - - 428
Total number of these cases that took cholera during this period - - - 5

It will thus be seen that of a total of 60 persons in the establishment, and 428 patients in the Institution, in all 488, only 7 exhibited cholera, being in the proportion of 1·43 per cent.

Five cases of cerebro-spinal arachnitis occurred in the sequela of cholera. In no single case was true cholera typhoid developed as a sequel of cholera.

MOUNTJOY MALE GOVERNMENT PRISON.

Report on the Cholera Outbreak at the close of the year 1866. By DR. ROBERT M'DONNEL.

A detailed account of the circumstances connected with this outbreak will, I conceive, have considerable interest in the eyes of medical men.

The facts have a seientific value on account of the neatness, precision, and accuracy with which they can be ascertained within the walls of such an institution as a prison. Let me state, that I do not myself advocate any theory on the subject of the propagation of malignant cholera. I do not doubt that the disease is capable of being communicated from the sick

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[a] The last cholera patient was discharged cured December 28, 1866.

to the healthy; but it appears to be equally certain that there are cases where malignant cholera cannot be logically traced to this origin. I shall confine myself to a simple statement of facts.

The Mountjoy Prison stands in a salubrious situation. Since it was opened for the reception of prisoners in the year 1850, the health of the convicts received into it has been such as to contrast favourably with other similar institutions. There has never been any prevalence of diseases, such as arise from imperfect sewerage; it is built on a heavy blue clay soil, and on a sloping ground, so that within the prison walls there is a fall of twenty feet from the upper to the lower part. There is a well of water (not used for the supply of the prison) about the centre of the grounds; this well is ninety-five feet deep, and the water is tolerably strongly chalybeate. The prison is built upon what is known as the Pentonville plan, that is four arms radiating from a centre. Each of these arms is known as a division (A, B, C, D divisions), and consists of corridors with cells on each side. There are three tiers of cells, one over the other. There are basement stories under each division except A. These basements contain store-rooms and workshops, but no cells. Each cell contains a little over eight hundred cubic feet of space, and there is an arrangement for ventilation (independently of the window), similar to that in Pentonville prison, where it is calculated that the air is renewed at the rate of about two thousand cubic feet per hour.

There is a water-closet in every cell, well trapped and supplied with an abundance of water. At the lowest extreme of the prison grounds there are three large underground sewage tanks, in which the more solid part of the sewage accumulates, and is used from time to time as manure; the liquid sewage flows off by a large sewer.

The canal of the north side of the city of Dublin has two branches in the angle between which the prison stands, the water in these branches is on a higher level than the ground on which the prison is built.

During the early part of December, 1866, the health of the prisoners was as good as it had been at any time for ten years before. On Saturday, December 22nd, 1866, there were 288 prisoners in the prison (145 convicts, and 143 untried political prisoners), there were only five sick in hospital. On the forenoon of Sunday, the 23rd December, five cases of malignant cholera occurred, of which three died before many hours. On the 26th two other cases were admitted to hospital, and on the 27th two more—of these one died; no case has occurred since then. In all there were nine cases of malignant cholera, of which four died. Upon the day following the first appearance of cholera, sixty-four cases of diarrhea were reported,[a] and placed under treatment—twenty-one convicts, forty-three among the untried political prisoners.

[a] Immediately on the first appearance of the disease each warder in the prison was directed to go round each prisoner in his charge and enquire whether he was suffering

As to the introduction of this disease from without by the warders or prison officers, the following are the facts :—

No one of the warders or other officers had had cholera, neither had there existed any cholera among their families.

Mr. Ward, the resident apothecary, had not seen any case of cholera for years. I had not myself been in contact with a case of cholera since the beginning of October (nearly three months before).

The prisoners attacked were not in communication with each other, or with the same warders. In short, I have been wholly unable to trace this outbreak to any communication between the sick and healthy. None of the warders, officers, or prisoners who were in attendance on those ill of cholera took the disease. It has been surmised that the disease may have been propagated from the Mater Misericordiæ Hospital, which is distant from the prison some 300 paces. I have learnt that there was no case of cholera in this hospital at the time that the disease broke out in the Mountjoy Prison ; the last case admitted to that hospital was taken in on December 17th, and died on the 18th ; for ten days before that there had been no case of cholera in this hospital.

Water Supply.—The water used in the prison is drawn from the reservoir from which the north side of the City of Dublin is supplied ; it is conducted through iron pipes, and passing through a filter of gravel is received in a large supply tank placed at the highest part of the prison ground, remote from, and about twenty feet higher than the sewage tanks. From the supply-tank it is pumped by engine to the cistern on the top of the prison. As it enters the supply-tank rather slowly through the filtering apparatus, it happens that the engine pumps it out more rapidly than the water flows in. The result is that at about four o'clock every day, the supply-tank is pumped nearly empty, and thus every twenty-four hours there is an entirely fresh supply of water drawn.

The female prison adjoining is supplied by water from the same tank ; no case of cholera occurred in the female prison. I examined the water, and have found it limpid and colourless. It is a water of as good quality as any supplied on the north side of Dublin ; it is pleasant to drink, free from odour or taste, sufficiently soft, and containing some saline matter (magnesia and lime).

Food and Dietary.—The bread, soup, milk, oatmeal, stirabout, &c., used in the prison appear to me to be of good quality ; the steward and cook inform me that they consider the food supplied during the month of

from any bowel attack ; 64 cases were returned by the warders, and at once placed under treatment.

The outbreak commenced and terminated within a week. The nine cases of cholera all presented symptoms of collapse ; in one case only were the cramps severe ; in all there was the usual vomiting, purging, cold-blue extremities, husky voice, sunken eye, thirst, cold tongue, and breath, &c.

December of good average quality. The beef used for the soup, &c., is supplied at the contract price of 5½d per pound (exclusive of bone), mutton 8d. per pound (not exclusive of bone). Bread 2·6 pence per two pound loaf.

The cooking is performed by a steam apparatus, and is carried on in large cast iron boilers kept scrupulously clean.

The untried political prisoners are permitted to get their own food sent in by their friends if they please; some half dozen only availed themselves of this privilege: one of those (who was not making use of any of the prison food at all) was among those attacked with bad choleraic diarrhea.

Among the other prisoners two distinct dietaries were in use, as follows :—

DIET ON SATURDAY, DECEMBER 22ND, 1866.

	Untried prisoners and working convicts	Convicts of probationary class
Breakfast . .	bread and coffee,	stirabout and milk.
Dinner . . .	{ ½lb. beef, broth and 2lbs. of potatoes, }	bread and milk.
Supper . . .	bread and milk,	bread and milk.

Cholera appeared simultaneously among the persons on these distinct scales of diet. As some have supposed that the milk was the special article of diet at fault, I have examined carefully into the circumstances concerning it. The milk supplied by the predecessor of the present contractor was of bad quality, it was supplied at the low figure 5½d. per gallon, it was frequently rejected, and finally the contract was broken. On September 6th, the milk contract was transferred to other hands at 10d. per gallon. Since then the milk supplied has been of good quality (it was, however, on one occasion, rejected October 5th, 1866).

I have frequently examined the milk, and have never found it to be adulterated with anything except water. The maximum of added water amounts to not more than 25 per cent. (usually much less than this), a dilution which I do not consider warrants the rejection of milk, inasmuch as the milk generally supplied throughout Dublin in private families is diluted to about this degree. In justice to the individual who at present supplies milk to this prison (and of whom, I may add, I know nothing), I feel bound to state that, in my opinion, the article furnished by him is good average milk.

Several of the prison officers from choice make use of this milk; from them I learn that they have had no fault to find with it—one of the prisoners who died of cholera had taken no milk the day before he was attacked, save the small quantity in his coffee which had been boiled.

TABLE of Cases attacked with Asiatic Cholera during the last Week of December, 1866.

Name of Prisoner	Reg. No.	Date of Reception in this Prison	Place whence he came	How long in the Cell in which his illness commenced	How long in this Prison	Number of Cell and Corridor §	Whether Premonitory Diarrhea existed, and how long?	Date of Admission to Hospital	Termination of Case
John K.	7238	April 27, 1866	Lifford Gaol, County Donegal	Nearly 8 months	8 months	C 2, 7 Cell	No premonitory diarrhea	Dec. 23, 1866	Death at 10 that night.
Wm. M.	Untried	Sept. 1, 1866	Kilmainham Gaol	1 month and 27 days	4 "	A 2, 13 "	No premonitory diarrhea	" " "	Death at 6 that evening.
J. M'C.	7255	July 9, 1866	Monaghan Gaol	2 months and 11 days	5 "	C 3, 37 "	Had diarrhea for 48 hours	" " "	Death at 12 next day.
G. T.	6987	May 12, 1866	Spike Island Prison	4 months nearly	7 "	D 3, 45 "	Violent vomiting was the first symptom	" " "	Recovery.
* J. H. C.	7045	July 13, 1865	Londonderry Gaol	12 days	5 "	D 2, 41 "	Diarrhea during night of 22nd	" " "	Recovery.
J. S.	7229	April 12, 1866	Spike Island Prison	About 8¾ mths.	8 "	D 2, 40 "	Diarrhea on the 24th, not checked by treatment	" 26, "	Recovery.
† A. L.	7230	April 17, 1866	Richmond Bridewell	About 1½ mths.	8 "	C 3, 32 "	First symptoms violent vomiting and purging	" " "	Recovery.
John M.	7100	Nov. 4, 1865	Maryboro' Gaol	5 months and 20 days	13 "	D 1, 23 "	Collapse from the first; no premonitory diarrhea	" 27, "	Death at 11 on night of 28th.
‡ T. N.	Untried	Dec. 18, 1866	Clonmel Gaol	About 8 days	8 days	B 3, 18 "	Premonitory diarrhea came on on the 26th; treatment did not check it, and vomiting supervened	" " "	Recovery.

* During convalescence this patient was covered with a rash resembling measles.

† This patient was for 24 hours apparently hopelessly collapsed.

‡ This man had never, to his knowledge, been in contact with cholera. There had been no cholera in Clonmel for three months before his committal.

§ A, B, C, and D indicate the wings of the prison radiating from a centre; 1 indicates the lowest story; 2, the second; and 3, the top. No case of cholera had occurred among any of the prison officers or their families. The outbreak terminated within one week from its first appearance. There were 64 cases of diarrhea reported on the first day of the outbreak; some of these were severe, and were attended with vomiting, but none are put down in this table save those who were in collapse.

Cases of cholera occurred in each wing of the prison, no wing escaped; with one exception all those taken ill of cholera were in the upper stories, four were in the highest story, four on the second, and one below.

I examined the closets in the cells which had been occupied by each case, and found that all were in good order.

None of the prisoners attacked had been under the depressing influence of any special punishment by curtailed diet or otherwise.

The prison faces south-west, and the Mater Misericordiæ Hospital stands 300 paces in front (that is south-west) of it. During the days which the cholera lasted, the wind blew from the south-west almost continually. On the night of the first appearance of the disease, the atmosphere was fully saturated with moisture—the wet and dry bulb thermometers stood equal. I subjoin a table (p. 473) giving some particulars concerning the individuals attacked. Happily the efforts made to prevent the spread were eminently successful.

Infected clothes were burned, incipient cases promptly attended to, and every part of the prison and hospital disinfected with carbolic acid and solution of sulphate of iron, which were thrown into the closets and sewers.

SIR P. DUN'S HOSPITAL.

Summary of Cholera Report. By E. W. Collins, A.B., Resident Medical Scholar.

Elizabeth Meyler, in a short time after the death of her husband from cholera, sickened, and was brought to Sir P. Dun's Hospital (Aug. 2nd, eleven a.m.) twenty-four hours and a half after being attacked, and died sixty-three hours and a half after admission, after an illness of eighty-eight hours.

This was the first case which sought admission into Sir P. Dun's Hospital.

There were in all 180 cases of cholera treated in this hospital, dating from August 2nd, 1866. Of these 180 cases, the particulars of 148 are as follows:—

Symptoms, &c., in 148 cases.	Number of patients thus affected.	Percentage of patients thus affected.	Number of patients not thus affected.	Percentage of patients not thus affected.
Purging	142	95·94	6	4·06
Vomiting	130	87·83	18	12·17
Cramps	84	56·75	64	43·25
Collapsed on admission . . .	74	50·	74	50·

Of these 148 cases 72 (48·64 per cent.) belonged to the male, and 76 (51·36 per cent.) to the female sex; 70 (47·29 per cent.) died, and 78 (52·71 per cent.) recovered. The average length of time which elapsed

between the commencement of the illness of each of these cases and their admission into hospital was 48·35 hours. Moreover, the entire duration of the disease in the cases of those who succumbed was, on an average, 79·34 hours. In other words, these patients lived, on an average, only 31 hours after they came into hospital. The order of constancy of the symptoms was, as may be seen, purging, vomiting, and cramps, the co-efficients per cent. of each of these symptoms, respectively, being 95·94, 87·83, and 50·75. Diarrhea, therefore, was all but uniformly present. Of the few cases, altogether six in number, in which it did not occur, 50 per cent. died, and it may be mentioned as a singular fact, that all save one belonged to the female sex. Five out of the six had vomiting and cramps, and two were collapsed on admission. One suffered only from cramps, and she died, her illness proving fatal in six hours: when taken out of the cholera-van she was found to be dead. Another, a boy, æt. six, who only laboured under vomiting, gradually exhibited the symptoms and signs of tubercular meningitis with effusion, of which he died 408 hours after admission; the autopsy verified the diagnosis. The details of these cases which were characterised by absence of the most constant of all the symptoms of cholera, are subjoined:—

TABLE CONTAINING THE DETAILS OF THE CASES IN WHICH THERE WAS ABSENCE OF PURGING.

Cases in which no diarrhea occurred	Vomiting.	Cramps.	Collapsed.	Length of illness in hours before admission.	Recoveries.	Deaths.	Period in hours of death after admission.	Females.	Males.	Ages.
1st	1	1	—	25	1	—	—	1	—	62
2nd	1	1	—	13	1	—	—	1	—	14
3rd	1	—	—	80	—	1	408	—	1	6
4th	—	1	1	6	—	1	0	1	—	22
5th	1	1	1	40	—	1	53	1	—	35
6th	1	1	—	24	1	—	—	1	—	40
TOTAL -	5	5	2	—	3	3	—	5	1	—

Of the effect of mental emotions as predisposing causes, in the production of cholera, the following is a remarkable instance:—

Eliza Singleton, æt. 25, a fruit-seller, sold some apples from her stall to a woman who was one of her usual customers. In a few hours after a funeral passed by, which, on enquiry, she learned was that of the woman to whom she had sold the fruit in the morning, and that she had died of cholera. Such was the effect produced by this intelligence, that on the moment she took ill, and had to be removed to her home. Purging,

vomiting, and cramps set in, and were rapidly followed by collapse. When brought to the hospital she was in a state of profound collapse, out of which she happened to be amongst the few who recovered. In another instance, a boy, aged five years, was admitted, labouring under an extraordinary presentiment that he should contract and should die of cholera, in consequence of the death of a playmate in the same house from the disease.

This child died, the disease running its fatal course in 23 hours. In two cases the commencement of the disease dated from the time of administration of a dose of ol. ricini. Errors of diet in a vast number of instances appear to be the predisposing causes. In a few rare cases, five in number, no vomiting or purging occurred during the stage of collapse in which they were admitted; these cases all died. As a rule, the cramps attacked the muscles of the upper less frequently than those of the lower extremities. Still less frequently those of the abdomen were engaged. A great number of the cases admitted suffered from suppression of urine in a greater or less degree. Coma was very frequently the precursor of death in the cases of suppression of urine, unaccompanied by any of the other signs of uremic poisoning. One of these patients secreted no urine for three days. But the most extraordinary case of recovery with this complication was that of a man named Maguire, aged forty, who suffered from suppression 72 hours. Another case (that of John Arthur, æt. 30), in which, according to the patient's own account, suppression had lasted for a corresponding period, was not attended with an equally favourable issue, death following at the close of the fourth day. In the case of a man, aged 39, suppression still continuing at the end of the 3rd day, blood to the amount of four ounces was taken from the arm, and in half an hour after he secreted and passed some urine. In another instance, however, though for the same complication, venesection was ineffectually tried. After suppression had existed for 60 hours, in another case, dry cupping over the loins was tried, and 12 hours after the secretion returned. The cadaveric twitchings which occurred in several instances are worthy of special notice. The case of a boy named Villiers, aged 10, may be more particularly alluded to. In this instance about five minutes after breathing had ceased, and all other signs of animation had departed, slight tremulous spasmodic twitchings and quivering of the muscles were observed, especially of those on the inside of the thighs, legs and feet (so much so, indeed, that inversion, exversion, flexion, and extension were frequently performed, and the left foot was at one time raised about three inches from the bed on which it had been lying) of the abdominal, the pectorals, and of the muscles of the forearms and of the hands. These cadaveric movements shortly after death were also very remarkable in the case of a woman, Emma Louisa Consen: about 20 minutes after death, the muscles of all her toes, the same set of muscles which had been especially, during life, the seat of the cramps,

were seen sometimes all together, sometimes one by one, to contract and relax. The patella also was frequently drawn up by the quadriceps extensor. The muscles of the abdomen visibly quivered and contracted. The blood was found to be of a thick black, and tarry consistence.

The general line of treatment adopted was to arrest the diarrhea and vomiting as soon as was possible, by the administration of astringents and sedatives. For these purposes acetate of lead and opium were exhibited. In cases where these remedies failed to moderate the diarrhea injections of acetate of lead and opium, to the extent of fifteen grains of the former with half a drachm of the acetous tincture of opium, were employed generally with marked effects. Dr. Kennedy's patients immediately after their admission got a mustard emetic. Where vomiting was the prominent symptom, hydrocyanic acid (dilute) in variable amount to the extent of seven drops was exhibited singly, or in combination with Schacht's solution of bismuth. For the same purpose acetate of lead, spearmint water, sinapisms to the epigastrium, and mustard emetics were employed. To relieve the cramps manual friction, chloroform inhalations, turpentine stupes, sinapisms, and in some cases immediate blistering, were the means adopted. It was in those cases in which the cramps were unusually severe that chloroform inhalations appeared to be attended with the best results. In and previous to the stage of collapse stimulation was resorted to, both externally and internally. Externally by sponging with powerfully stimulating liniments of compound camphor liniment and chloroform, by the employment of manual friction, by dry heat (by means of hot jars and heated sand), and by swathing the body and limbs in flannel. Internally by the exhibition of brandy, wine, mustard emetics (Kennedy), and camphor and chloroform in solution (Banks). When suppression of urine supervened this was combated by hot stupes of turpentine to the hypogastric region, by dry and wet cupping over the loins, and in some rare cases by venesection. In some cases, though urine was secreted, it was retained in the bladder; in these cases the catheter afforded relief. The solution of the permanganate of potash was given internally by Dr. Moore in a few instances, but its use was soon discontinued. Calomel also was similarly tried by Dr. Kennedy with little efficacy.

The mortality among the patients bore a direct proportion to the length of time they lasted after admission. Thus, amongst those who came into the hospital, the greatest mortality occurred within the twelve hours succeeding the admission, 21 per cent., or one-fifth of all the patients admitted, having died within that time. More than one-third (37·57 per cent.) died within 36 hours, somewhat less than one-third (3·21 per cent.) within 24 hours, and, as before stated, one-fifth (21·02 per cent.) within 12 hours after admission; one-fifth (21·02 per cent.) died between the 1st and the 12th hours (inclusive), one-tenth (10.19 per cent.) between the 13th and the 24th (inclusive), and one-sixteenth

(6·36 per cent.) between the 25th and the 36th hours subsequent to admission. The following is a return, in a statistical form, of those cases—58 in all—which died 36 hours after admission :—

Hours after admission (inclusive)	Deaths	Per centage of deaths, in relation to the total number of deaths (72)	Per centage of deaths, in relation to the total number of cases admitted (157)
12	33	45·83	21·02
24	49	68·05	31·21
36	58	80·55	37·57
Between 1st and 12th . .	33	45·83	21·02
,, 13th and 24th . .	16	22·22	10·19
,, 25th and 36th . .	9	12·50	6·36

The particulars of these cases are subjoined :—

Time of the Deaths after Admission, in hours	Under the care of Dr. Moore	Under the care of Dr. Kennedy	Under the care of Dr. Banks	Males	Females
0	1	—	—	—	1
½	1	—	—	—	1
1	—	—	1	1	—
2	1	—	2	2	1
2½	—	1	—	1	—
2¾	2	—	—	1	1
4¼	1	—	—	1	—
6	—	2	3	2	3
7½	—	1	—	1	—
8	1	—	1	—	2
8¼	2	—	—	—	2
8½	2	—	—	2	—
9	2	—	—	—	2
9¾	—	1	—	1	—
10	1	—	1	1	1
11	1	—	1	—	2
11½	—	1	—	1	—
11¾	—	—	1	1	—
12	2	—	—	—	2
12¾	—	1	—	—	1
13	1	2	—	2	1
13½	—	1	—	—	1
14	1	—	—	1	—
14½	1	—	—	—	1
15	1	—	—	—	1
17	1	—	—	—	1
18	1	—	—	—	1
20	1	—	—	—	1
21¾	—	1	—	1	—
22	1	1	—	2	—
24	1	1	—	—	2
24½	—	—	1	1	—
26	—	1	—	—	1
27	—	1	—	1	—
29	—	1	—	1	—
30	1	—	—	—	1
31½	1	—	—	—	1
32⅔	1	—	—	1	—
33	1	—	—	—	1
36	—	—	1	1	—
Totals, -	30	16	12	26	32

It will be seen from the foregoing table that, of those who died within 36 hours after admission, an unusually large number fell to the lot of Dr. Moore, a fact which accounts for the high coefficient of mortality (50 per cent.) of the patients who came under his charge.

It has been stated that the greatest mortality in cholera occurs at the extremes of life, among the very old and the very young. The truth of this may be tested by the following return of the cases between the ages of 1 and 79 (inclusive) :—

Ages (inclusive)	Recovered	Died	Males	Females	Total number of cases	Per centage of deaths amongst those attacked
1 to 9	17	12	16	13	29	41·38
10 to 19	17	10	14	13	27	37·03
20 to 29	18	13	14	17	31	41·93
30 to 39	9	13	13	9	22	59·09
40 to 49	7	12	8	11	19	63·15
50 to 59	4	6	3	7	10	60·
60 to 69	2	4	2	4	6	66·66
70 to 79	1	–	1	–	1	—
Total, -	75	70	71	74	145	48·27

The return shows that, of the patients admitted into Sir P. Dun's Hospital, the greatest mortality occurred amongst those between the ages of 60 and 69, and 40 and 49 (inclusive), the least amongst those between the ages of 10 and 19 and 1 and 9 respectively (inclusive). The epidemic spared neither age nor sex. The mortality amongst each sex was almost alike ; each was alike obnoxious to the poison.

Sex	Died	Recovered	Total number admitted	Per centage of those who died	Per centage of those who recovered	Per centage of the total number of cases admitted
Females,	44	50	94	51·76	52·63	52·22
Males,	41	45	86	48·24	47·37	47·78
Total,	85	95	180	100	100	100

Of 180 cases admitted into this hospital, 94 (52·22 per cent.) belonged to the female, and 86 (47·78 per cent.) to the male sex. Of the former 44 (51·76 per cent.) died, and 50 (52·63 per cent.) recovered. Of the

latter 41 (48·24 per cent.) died, and 45 (47·37 per cent.) recovered. Thus the coefficients of mortality of the sexes only differed in the trifling sum of 3·52 per cent.

Again, if the time during which the epidemic of cholera prevailed—from August 2nd, 1866, to January 1st, 1867 (inclusive)—be divided into five periods of a month each, the coefficients of mortality for each of these periods in their order; and finally, the total coefficient of mortality of the patients admitted into this hospital, will be found in the annexed table.

THE COEFFICIENTS OF MORTALITY :—

Monthly periods	Admission	Deaths	Recoveries	Coefficients of mortality per cent.
First (August 2nd to Sept. 1st),	22	12	10	54·54
Second (Sept. 2nd to Oct. 1st),	51	25	26	49·01
Third (Oct. 2nd to Nov. 1st),	77	35	42	45·45
Fourth (Nov. 2nd to Dec. 1st),	27	13	14	48·14
Fifth (Dec. 2nd to Jan. 1st),	3	–	3	—
Total,	180	85	95	47·22

From this table it may be seen, as has been elsewhere observed, that the earliest cases of cholera were by far the most fatal. The coefficients of mortality steadily decreased during the 1st, 2nd, and 3rd monthly periods, but rose again upon the 4th to almost the same rate as during the 2nd.

The general line of treatment adopted by each of the physicians who had charge of the hospital during the prevalence of the epidemic was practically almost the same. It would, therefore, be predicated that there would be little variation in the coefficients of mortality of the patients under each, and such, indeed, was the fact. For the high rate of mortality amongst the patients of Dr. Moore may be fairly attributed to the large proportion of the rapidly fatal cases which came under his charge. And, with regard to the low coefficient of Dr. Banks, who succeeded Drs. Kennedy and Moore on November 1st, it must be borne in mind that the epidemic was then on its decline. The following table shows the number, and the coefficients of mortality and of recovery, of the patients under each of the physicians :—

The Physicians	Admissions	Deaths	Recoveries	Coefficient of Mortality per cent.
H. Kennedy, M.D. - -	79	37	42	46·83
W. Moore, M.D. - -	70	35	35	50·
J. T. Banks, M.D. - -	31	13	18	41·61
Total, -	180	85	95	47·22

It only remains to notice the dimensions of the cholera wards :—

The Cholera Wards	Height (in feet and inches)	Length (in feet and inches)	Breadth (in feet and inches)	Number of cubic inches of air in each ward	No. of beds in each ward	Number of cubic inches of air to each patient	Number of cubic feet of air to each patient
Female,	19·3	37·3	29·8	36,759,492	8	4,594,936·5	2,659·10
Male,	20·1	37·6	29·6	37,391,300	8	4,673,912·5	2,704·86

These wards, set apart at a time when the epidemic had not yet reached this city for those who might suffer from this disease, were each capable of containing 36,000,000 cubic inches of air. Each ward—that allotted to the females and that to the males—had eight occupants. Each of these, therefore, was allowed four and a half million cubic inches, or two and a half thousand cubic feet, of air. To this fact may be traced the good health of those who attended on the sufferers; and, in great measure, the recoveries of those who suffered from the epidemic.

MATER MISERICORDIÆ HOSPITAL.

Abstract of Report on Cholera. By Dr. HAYDEN and Dr. CRUISE.

During the prevalence of the late epidemic, 197 cases of cholera were treated in this hospital; of these a total of 106 proved fatal, and 91 recovered. Of cases in the first stage of cholera, or *choleraic diarrhea*, there were admitted 54, of these 52 recovered, and 2 died.

Of cases in the second stage of cholera, or *collapse*, there were admitted 124, of these 85 died, and 39 recovered.

These numbers do not include 19 cases which were admitted in a moribund state, and beyond hope from treatment.

The following tables exhibit the foregoing statements in detail :—

TABLE I.

Week ending		No. of cases	Average duration of illness in house		Average period in Hospital, in hours		Result		Per centage of deaths
			H.	M.	H.	M.	Died	Recovd.	
1.	August 21	1	600	0	432	0	0	1	
2.	August 28	4	47	0	34	45	2	2	
3.	Sept. 4	13	109	13	75	41	3	10	
4.	Sept. 11	18	66	9	42	41	10	8	
5.	Sept. 18	13	139	34	94	28	6	7	
6.	Sept. 25	30	89	14	55	14	19	11	
7.	October 2	17	92	39	72	50	6	11	
8.	October 9	22	82	19	54	29	14	8	
9.	October 16	16	62	58	43	42	11	5	
10.	October 23	21	53	42	96	8	10	11	
11.	October 30	11	120	12	69	43	5	6	
12.	Nov. 6	9	127	6	96	33	3	6	
13.	Nov. 13	11	75	32	57	18	9	2	
14.	Nov. 20	7	28	12	16	51	6	1	
15.	Nov. 27	2	91	7	76	7	1	1	
16.	Dec. 4	1	84	0	52	0	0	1	
17.	Dec. 11	0	0	0	0	0	0	0	
18.	Dec. 18	1	26	0	19	0	1	0	
	Total, - -	197	105	16	77	11	106	91	53·8

TABLE II.

Number of cases in which attack was due to any assignable cause, not including infection—92.

CAUSES ASSIGNED					PER CENTAGE
Neglected diarrhea,	-	-	-	65	33·0
Intemperance,	-	-	-	18	
Foul water, -	-	-	-	2	
Meal of cockles,	-	-	-	1	
Sour porter, -	-	-	-	1	
Meal of cold cabbage,		-	-	1	
Do. of fish, -	-	-	-	1	
Do. of pork,	-	-	-	1	
Do. of badly cooked cabbage,		-	1		
Dentition,	-	-	-	1	
				——	
				93	

TABLE III.

Ages of patients within decennial periods, and result :—

Age under 10 years	No. of cases	Died	Recovered	Per cent. mortality
10 to 20	37	20	17	54·0
20 to 30	27	9	18	33·3
30 to 40	47	19	28	40·4
40 to 50	35	22	13	62·9
50 to 60	26	19	7	73·7
60 to 70	14	12	2	85·7
70 to 80	7	3	4	42·8
	4	2	2	50·0
	197	106	91	

TABLE IV. A.

Ages of patients, within decennial periods, admitted in stage of Choleraic Diarrhea; summary of treatment; and result :—

Age	No. of Cases	Treatment	Died	Recovered	Per Centage
Under 10 years	6	* Dilute sulphuric acid and opium, creasote-water *ad libitum*, ...	–	6	
10 to 20	7	6 dilute sulph. acid and opium ; 1 chalk mixture, -	–	7	
20 to 30	19	12 do. do. do. in 1 this was preceded by a draught of castor oil, and in another it was followed by calomel given as stated below ; 1 case got tinct. opium m x in an ounce of brandy, calomel was then given followed by bismuth and chlorodyne draughts ; in one case a draugnt of oil with tinct. opii., and creasote-water for drink ; in 4 cases purgatives were given, and 1 was treated expectantly, - -	–	19	
30 to 40	10	In 1 case acid and opium mixture with creasote, and external heat constituted the treatment ; 4 acid and opium ; 1 calomel and creasote ; 2 chalk mixture ; 1 expectant, - . -	–	10	
40 to 50	4	In 1 tinct. opii. with nit. spirit ether and camph. mixture was given, preceded by draught of c. oil ; in 1 oil draught followed by calomel in usual doses ; 1 chalk mixture ; 1 acid astringent do. - - - - - -	1	3	3·7
50 to 60	2	Acid astringent mixture, - - - -	–	2	
60 to 70	4	1 acid astringent mixture ; 1 calomel followed by bismuth, chlor. ether, and tinct. opii. in camphor mixture ; 2 chalk mixture,	1	3	
70 to 80	2	1 chalk mixture, 1 spir. am. aromat. with laudanum, -	–	2	
Total, -	54				

* The mode of administration of sulphuric acid was usually as follows:—10 to 15 drops or more of the dilute, or of the sulphuric acid and with 5 drops of laudanum, and frequently 5 drops of tincture of capsicum, myrrh, or camphor, in an ounce of water, given after each evacuation.

TABLE V. B.

Ages of patients within decennial periods admitted in stage of collapse (*Algid Cholera*)—summary of treatment and result :—

Age	No. of cases	TREATMENT	Died	Recovered	Per centage
Under 10 years	26	21 calomel, in 3 of which concentrated solution of camphor was likewise given, and in two of them inhalations of the nitrite of amyl; in 1 the warm bath; 4 diffusible stimulants, and in 1 of them also amyl inhalations; 1 arsenic; sinapisms and creasote-water,	15	11	12·1
From 10 to 20	19	13 calomel, and in 2 of these bismuth, &c., draughts; 2 quinine (1 with chloric ether); 2 stimulants; 4 diffusible stimulants, with effervescents; 1 digitalis, with spirit of juniper and nit. sp. of ether, . .	7	12	5·64
„ 20 to 30	25	21 calomel (in 4 preceded by dose of castor oil), and in 9 of these bismuth and chlorodyne, draught, &c.; oxygen inhalations in 2 cases, and n. amyl in 1; venesection in 1; 2 got diffu. stim. and effervescents; 1 Belladonna and permanganate of potass; and 1 arsenic, ...	17	8	13·7
„ 30 to 40	19	15 Calomel, with sinapisms, heat, and friction; of these 3 got brandy, 1 spt. camphor, and 1 amyl inhalations; 1 permang. potass; 1 hyposulphite of soda, with digitalis and dry cupping; 2 stimulants, .	16	3	10·9
„ 40 to 50	20	12 calomel, and 5 of these bismuth, creosote, and morphia also, after each dose of calomel; camphor in 2; amyl inhal. in 1, and oxygen do. in 1; castor oil before the calomel in 2; in 2 digitalis, with n. s. ether; and in 2 stimulants, ...	11	4	12·9
„ 50 to 60	10	9 calomel; in 1 of these bismuth draughts; 1 hyposul. soda; and in 1 oxygen inhalations, ...	10	0	8·0
„ 60 to 70	3	2 diffusible stimulants; 1 calomel, ...	2	1	1·61
„ 70 to 80	2	2 calomel; in 1 of these diffusible stimulants also, .	2	0	1·61
Total,	124		85	39	68·5

Calomel was given as follows, viz. :—Gr. x. were given at once, and subsequently gr. ii. every hour. In the case of children, the doses were reduced in proportion to the age. In the event of the stomach rejecting the calomel, a draught, consisting of liquor bismuth with chlorodyne, was given after each dose. In cases in which the stomach still continued to reject the mercurial in this form it was administered by injunction or suppository. The drink given was creasote-water (m. iii. to a pint of water) *ad libitum.* The nitrite of amyl was administered by inhalation in several cases, with the result of a slight but temporary elevation of temperature; oxygen was likewise similarly given in some cases, but with no marked beneficial result.

Post Mortem Appearances in Collapse.

General condition of body.—The *post mortem* rigidity of very short duration ; lividity less marked than before death ; in some cases temperature raised.

Cerebro-spinal system.—Cerebral veins and sinuses engorged with dark liquid blood ; in cerebral ventricles and subarachnoid spaces a small quantity of clear serum ; puncta cruenta large and numerous ; spinal cord and membranes normal.

Ganglionic system.—Solar plexus and semilunar ganglia normal.

Thorax.—Lungs congested but still crepitant ; right cavities of heart filled with dark uncoagulated blood ; left auricle and ventricle contracted and empty—the latter much reduced in size, and its walls thickened.

Abdomen.—Liver, spleen, and kidnies normal; peritoneal investment of viscera white and polished; mesenteric glands considerably enlarged. Stomach containing a small quantity of gruel-like fluid; mucous lining of vesophagus prolapsed into stomach, and presenting the appearance of wet parchment; mucous lining of stomach mamillated; intestinal canal nearly filled with a fluid like thin boiled starch mixed with white floculi. Brunner's glands enlarged; both solitary and agminate glands enlarged and filled to distention with opaque fluid; mucous lining vascular in jejunum and upper part of ileum; towards termination of ileum Peyer's patches were in a state of erosion, the contents of the glandules having escaped through small apertures, visible on the surface. The fluid contents of the glandules, examined under the microscope, were found to consist of large granule cells and amorphous granular matter.

Larynx.—Vocal cords thickened and ventricles reduced in size, but without vascularity.

Diffusion of Cholera.—In no instance did the disease spread in the hospital, although, during the whole continuance of the epidemic, many were fully exposed. Of these we may specially mention the Sisters in charge of the wards—the medical officers, the clinical clerks—the class—the ward maids and porters engaged in carrying up the sick and removing the dead. One woman, in one of the general wards, took cholera and died; upon full investigation the origin of her case was clearly traced to an infected lodging-house in which she had stopped previous to entering the hospital.

Disinfection, Ventilation, &c.—The *excreta* of the patients were promptly disinfected by means of chloride of lime and carbolic acid. Thorough ventilation was scrupulously attended to. The patients generally had a breathing space of more than 2,000 cubic feet.

Second Night, April 4th, 1867.

Dr. Stokes, President of the College, in the Chair.

The President said that since the last night of meeting a very important report had reached Dublin of a singular outbreak of cholera in the city of Utrecht, in Holland, which had been submitted to him by his friend Dr. W. D. Moore, with a short abstract; and it was the opinion of the Council that, looking at the great importance of this report, which gave an account of an outbreak of cholera in many respects analogous to that at Mountjoy Prison, recorded by Dr. M'Donnell, it would be desirable, if Dr. Moore would be kind enough to initiate their proceedings by the reading of that paper. Dr. Darby had also a report of the outbreak at Bray, but he would incorporate the matter of it in his speech that night.

Dr. Moore then read the following :—

Mr. President—Two or three days ago I received from Professor Donders, of Utrecht, the loose sheets of a recent number of the Dutch *Archives of Medicine*, in looking through which I met with an interesting account, by Dr. Snellen, of a very remarkable outbreak of cholera which occurred last year in a limited district of Utrecht, during the prevalence of that disease in an epidemic form in the city at large.   It appears to to me that this epidemic within an epidemic, if I may so speak, presents some points of resemblance to the very remarkable outbreak which occurred last December in the Mountjoy Prison, and which has been so ably described by Dr. M'Donnell, and that it might be profitably taken into consideration in connexion with the report from the prison already in the hands of the members of this society.   I have, therefore, made a very short abstract of Dr. Snellen's communication, which, as you, sir, and the Council have kindly permitted me to bring it forward on the present occasion, I shall now read for this meeting.

Local Extension of the Cholera Epidemic : Utrecht, 1866.   By DR. H. SNELLEN.   Abstract of the above paper from the *Nederlandsch Archief voor Genees en Natuurkunde*, 1866, Deel 2.   Aflevering 4.   By W. D. MOORE, M.D., Dub. et Cantab., M.R.I.A.

The first case of cholera occurred in Utrecht (the population of which is about 60,000) on the 6th April, 1866 ; the second on the 21st of the same month.   The subsequent numbers were, up to the

11th June,	-	-	-	-	224 cases.
11th July,	-	-	-	-	1,734 ,,
11th August,	-	-	-	2,221 ,,
The middle of September,	-	-	2,400 ,,

In the Gasthuis-steeg (Hospital Lane), the seat of the special outbreak now under consideration, the first case occurred on the 11th June, the last on the 6th of July.   Seventeen per cent. of the population were attacked, and ten per cent carried off by the disease.   The course of the local epidemic extended over twenty-five days, before or after which time not a single case occurred, although in other parts of the city cholera was met with from April, and continued to rage in the middle of September, the date of Dr. Snellen's paper.

The Hospital Lane is a passage connecting Bilt-street and the White Lady Counterscarp, and running from the north-east to the south-west. Its length is about 150 yards, its average breadth is only four yards, while, according to the building regulation, it should be at least eight yards.   It is not a public way, the thoroughfare being in general closed against carriages.   It contains, including the three courts connected with

it, seventy-five houses, all of one storey; eighty-three families, and 380 inhabitants.

The author enters into details respecting the several houses invaded by the disease, and their relation to pumps and privies, to follow him through which would occupy too much time. On the plan annexed to his paper the number of inhabitants in each house is represented by a corresponding number of circles, plain in the case of those who escaped the disease, black in the case of those attacked by it, and black with crosses annexed to represent patients carried off by cholera. The *plain* circles with crosses annexed, of which there are, I believe, only two in the plan, represent individuals who died during the twenty-five days of other diseases than cholera; the plain circles outside the houses represent more recently arrived inhabitants; the pumps are marked by a double circle and an appendix; the privies are evident; the grates of sewers are marked by shaded parallelograms; the date connected with each patient indicates the period of his or her attack.

It may be well to quote a couple of examples to show the apparently capricious nature of this invasion of cholera. The author says:—

" It was a meritorious work of the *Society for the Improvement of Dwellings* to purchase and considerably to improve the first block of houses, which was in by far the most wretched state. These four houses (148*a*, 149*a*, 150*a*, 151) were then raised some feet, as was the yard behind them, and good drainage was secured. We find here one good pump and two privies. The adjoining block—152-155—continues as low as before; the yard behind it is in general a pool; there is one privy, which does not deserve the name.

" It is remarkable that in the first block—in the now good houses— among the twenty-two inhabitants, four cases (eighteen per cent.) of cholera occurred, while on the other hand, in the block of unimproved houses, among the seventeen inhabitants, not a single case was met with.

"It now remains to examine the largest block of houses (166*n* to 166*pp*)—a block which has acquired a sad celebrity, inasmuch as thirty-two cases of cholera have occurred among 106 inhabitants—that is, thirty per cent. Of these thirty-two cases, twenty-three proved fatal; *twelve times more* cholera having occurred in this locality than had, on an average, at the time (in the beginning of July) visited the whole city. (In the beginning of July cholera had attacked 2·5 per cent., at the close of the epidemic four per cent. of the population.)

" It seems important to examine this block of houses accurately. We here find twenty-one houses, all of one story; twenty of them harbour each only one family. The houses appear to be well built, and are comparatively well kept. Each dwelling consists of two apartments and a garret. Front and rear we find in each house a door and a window; there is consequently abundance of light and air. Behind these twenty-one dwellings

is a common yard, in which, along the houses, is a lane or trottoir, to which I shall revert; along it is a row of linden-trees; the further part of the place serves as a bleach-green. The inhabitants belong (or rather a considerable number of them belonged) by no means to the pauper class.

" The great mortality here attracts our attention still more, when we come out of the immediately adjoining Stevens' foundation. The Stevens' foundation is separated from the Hospital Lane only by a wall. In it 260 persons dwell in fifty houses; here only one fatal case occurred, and, that in the person of a woman, who had been, just before, day and night in the family of her son, where three persons were lying at the same time in cholera. In other parts, too, of the neighbourhood of the Hospital Lane, comparatively little cholera was seen at that time."

Behind these dwellings we find seven privies; they are in comparatively good order; they discharge into a channel which runs along the wall behind the bleach-green, to the moat. Into this same channel the privies of the Stevens' foundation empty themselves. We find here two pumps, yielding clear and well-tasted water; to these pumps we shall revert.

Of the 380 inhabitants of the Hospital Lane 170 were of the male and 210 of the female sex; 28 men and 35 women were attacked by cholera; that is of the men 16 per cent. and of the women 16·5 per cent. This is indeed a remarkable equality for the two sexes. The inhabitants are all industrious people, earning 10s. to 16s. a week.

" In former epidemics there were attacked in this district, in 1832, 2 cases, in two dwellings; in 1849, 22 cases, in 9 dwellings; in 1859, 2 cases, probably in 1 dwelling; in 1848, no case occurred, nor in 1853, 1854, and 1855. In 1866 the total number of cases was 63, or 16·6 per cent. of the population, while the deaths were 39, or 10 per cent."

The question, observes the author, rises to every one's lips—" Whence in this case the local violence of the epidemic, so extremely limited in time and space, running its course in twenty-five days, confining itself in its immediate vicinity to one street?"

To answer this query would be, he further remarks, to answer the general question—" What is cholera and whence comes it?" It is certain that in the Hospital Lane no special causes were discoverable, and the phenomena observed in connexion with the first appearance of the disease are precisely the same as have been witnessed in a great number of other points of the city.

On this subject the author endeavoured to throw light by experiments upon animals. In contrast to former statements, he did not succeed in conveying the disease to them. He tried dogs, an ape, a pig, rabbits, hens, frogs, and fishes.

The principal questions connected with the spread of cholera are :—
Is the infecting matter transmitted through the air ?

Is the earth the conductor of the contagion ?

Can direct transference from sick to the sound exist ?

"The cholera proceeds from one sick individual and infects others." As to the truth of this proposition all are agreed. It has been satisfactorily demonstrated that the disease arises epidemically in no place where it cannot be conveyed by the sick, or by what was in contact with the sick. But how further? "Through the air?" Many think so. On this point the author proceeds to quote the International Sanitary Conference at Constantinople, and also the views of Pettenkofer. In his own opinion *it is exclusively the digestive organs by which the infecting matter enters the body.* In support of this view he examines in detail the pumps and privies in Hospital Lane, and concludes his paper in the following words:—

"We have in vain sought for any fact plainly at variance with the proposition that the cholera miasm must be received exclusively in the digestive organs. We are convinced that the hypothesis of the transmission of the contagion, not through the air, and not through mere contact, removes the difficulties always correctly adduced against the former idea of the contagiousness of cholera.

"It is true that the final cessation of the epidemic is difficult to explain: why does it not always continue? This difficulty, however, cholera presents in common with all epidemic diseases, as well as with the diseases of plants and animals.

"Every investigation as to the influence of atmospherical causes upon the advent and departure of the epidemic has hitherto afforded only negative results. Only it would appear that much rain favours the decrease of the disease. It is certain that the rain washes away and washes out much. In the night between the 29th and 30th June, in the course of about eight hours, sixty-five million gallons fell on the surface of Utrecht; as much as if each of the inhabitants had on that night employed fifteen or sixteen gallons in washing the ground.

"It is more than probable that in cholera, as in all other diseases, the individual influence of receptivity exists: the same injurious agency, which produces cholera in one, will probably in another develop only choleraic diarrhea.

"We may reasonably hope, that individual receptivity will diminish, if we proceed energetically in the beaten way: '*providing for good drinking water, for the improvement of the food of the people, for the promotion of cleanliness, and for the removal of injurious filth, for the improvement of dwellinys,*' and not less '*for the investigation of endemic diseases.*'"

Dr. Darby said he had not originally the slightest intention of making any report of what had occurred in the hospital under his care until he heard the reports which were read on the last evening, and those reports being so very different in their results, he thought it right to take an opportunity of mentioning the facts which had come under his own

observation, and which he had publicly recorded. He had, between the 28th of September and the 28th of December last, sixty-one cases of what he had entered in his registry as cases of cholera, and out of which he had only seventeen deaths. Now, when he heard the reports read the other night, he thought he must have made a great error in entering those cases, or many of them, as true cases of cholera; but he came, on considering the matter, to the conclusion that the gentlemen who had made some of the reports from the large Dublin hospitals were at issue with him as to what cholera was. One gentleman said he did not regard as cholera any case that had only purging, vomiting, and cramps. Now, he had recorded cases as cholera that had only purging, vomiting, and cramps, with peculiar expression of countenance. If such cases were not to be regarded as instances of true cholera, then he was altogether at issue with some of his medical brethren, and he thought the statistics of the disease obtained from the country dispensaries generally would be very fallacious. He did not think that a case of purging, vomiting, and cramps, during an epidemic of cholera, could be considered as any other disease but cholera. He was actively engaged in 1832 as a pupil attending cholera cases that occurred in Dublin, and ever since that he had been engaged in the treatment of cholera cases on every occasion when the disease appeared in this country; and he would say this, that he had never seen what was called English cholera—that disease met with in the latter end of Summer or Autumn, and which they were in the habit of attributing to the eating of fruits or fresh vegetables—he had never seen that disease as an epidemic in his life. He thought when an epidemic of cholera was present, and a patient was attacked with purging and vomiting, they had no option, but must call the case one of cholera. Take any other disease that was an epidemic—scarlatina or typhus, for example—and if they excluded all malignant cases, and took nothing but the mildest types of it, they would see what an alteration would be made in the average of mortality. He saw no difference between English cholera and Asiatic cholera, but that one appeared sporadically, and the other as an epidemic. He did not know what people meant when they spoke of choleraic diarrhea. He had seen diarrhea when cholera was present, but that it was different from diarrhea, properly so called, when cholera was not present, he could not perceive. Again, if it were said that cholera depended on a certain poison, and if it were said that when a person was attacked by diarrhea, that would, if unchecked, run into cholera, which was the generally received notion, what followed? Was it not clear, if diarrhea runs into cholera, and if cholera depends on a poison, that the man who had the diarrhea must have been poisoned in the first instance? Was it not a poison, if there be a poison, that gave the diarrhea? He had dwelt upon this point to justify his own report. He should not wish that any one would suppose for a moment that he

would exaggerate the results of his treatment, or call a case one of cholera which he did not believe to be cholera ; and if he did not give an explanation of this kind, it might appear either that he was presumptuous enough to suppose that he could cure patients in a greater proportion than the greatest physicians in the land, or that he was altogether ignorant of what cholera was. He had divided the total of sixty-one cases received into the Rathdown Hospital, from the 28th September to the 28th of December inclusive, into three classes—viz., males under ten, females above ten, and children of and under ten years of age. In the month of September there were two males and two children, and one male died. In October five males, thirteen females, and nine children— a total of twenty-seven. There were two deaths of males, two of females, and three children, making a total of seven deaths. In November six males, nine females, seven children—total, twenty-two ; the deaths were one male, two females, and two children—total, five. In December two males, three females, and three children—total, eight ; the deaths were two males, one female, and one child—total, four. He had further divided the patients into mild and severe cases, meaning those that did not go into collapse and those who did. Thus seven males, nine females, and several children, making a total of twenty-three cases, were ad- mitted to hospital in a state of collapse. Of the thirty-eight who were at the time of their admission not in that stage, seven went into collapse and thirty-one pursued a mild course. The youngest child who died was only four months, the oldest man was seventy years.

Dr. MacSwiney said—The five Dublin reports, of which the "abstracts' were now before the association, and which they might expect to see in a short time published in a full and complete form—must be regarded as important documents, embodying the experience of skilful physicians, and containing a very large and varied amount of information respecting the recent outbreak of epidemic cholera. And, if the value of the facts contained in these reports were not as great as it might reasonably be ex- pected to be—and he thought that this was the case—he ventured to say that the explanation would be found in the circumstance that one condition, essential to the full success of such reports, was not adopted at the outset. He alluded to a fixed uniform basis of tabulation, under the several "heads" of which could have been clearly catalogued the different items in each report. Had this been done, they would now have had before them a means of observing at a glance, the several facts stated and con- clusions arrived at, each under its proper designation ; and he believed that, in that way, great additional weight would attach to the reports. As it was, he feared it would be difficult to extract, and present, in a con- densed form, the full value of all the information contained in these documents. The principal points respecting *Asiatic cholera* required to be elucidated may be stated to be—

Its nature (including the question of contagion).

Its best treatment.

Its best preventatives.

Its present death-rate.

He had analysed the "Abstracts" with a view to discover what help towards advancing our knowledge upon these points might be derived from the study of them. The following short table would show, in his opinion, that an error, fatal to the full usefulness of these reports, was made in not originally basing them upon a common foundation, where a uniform shape and nomenclature would be used :—

Hospitals	Admitted	The Cholera	Promoni-tary	Diarrhea	Purging	Vomit-ing	Vomit-ing and Cramps	Collapse	Consecu-tive Fever	Death rate per cent
Mater Misericer.	197	—	—	54	—	—	—	124	—	53·8
Meath, -	130	—	8	—	—	—	—	117	5	51·5
Dun's, -	180	—	—	—	142	130	84	74	—	47·2
Hardwicke, -	277	193	—	68	—	—	16	—	—	66·3
Mountjoy, -	9	—	—	4	—	2	—	1	—	44·4
Total, -	792	193	8	126	132	142	100	316	5	

This table might be greatly extended in the same direction. It was not necessary to indicate, in detail, what it shows; he would merely remark that the terms placed over the several columns *were those employed in the Reports*, an inspection of which would at once point out the nature and grounds of his objection. An adherence to a common plan would also, probably, either prevent the following discrepancy between the statements in two of the reports, or else explain the cause of such a singular difference in the experience of the two hospitals.

"The earliest cases of cholera were by far *the most fatal*."—*Duns*.

"The earlier cases were more amenable to treatment; while, as the epidemic advanced, the disease assumed a more malignant type."—*Meath*.

As to the treatment, he did not think any certain or exact conclusion could be arrived at from a study of the allusions to the very numerous remedies contained in the "Abstracts." Perhaps the reports, when published in full, might contain some more precise information on this point than was indicated in the "Abstracts." He assured them that he made those remarks in the interest of science alone, and that he was fully sensible of the great amount of important facts and observations detailed in these valuable reports.

Dr. Lyons said they all knew that in cholera epidemics there was a vast difference in the mortality in different portions of the country. He could not agree with the last speaker that it would have been of advantage to tabulate the cases from a common point of view. He thought by the method adopted they had derived much more satisfactory information

than if they had obtained it in accordance with one uniform plan. Presently he would have to suggest a mode by which the data collected might be reduced to a uniform standard. He thought it might be useful to state what the exact data of mortality was as recorded in other epidemics. During the epidemic of 1848–9 in England, the cholera destroyed 85 in 10,000 inhabitants in low sea-side districts; in inland towns it was fatal to 38 in 10,000 inhabitants; in London to 62 in 10,000, and in country localities near small streams to 12 in 10,000 inhabitants. The general average of deaths for England was 30 in 10,000 inhabitants, the total deaths for all England in 1849 being 53,292. Now calculating on such data, the late Dublin epidemic was fatal in the proportion of 40 in 10,000 inhabitants. Some other data of interest might be derived from the facts before them as compared with the facts of other epidemics. In England in 1849 the co-efficient of invasion of the disease or its power of extension will be found to have been for all attacked 0·95 per cent. of the whole population. In the remarkable epidemic at Utrecht brought before them that evening, the per centage was 9, a most extraordinary amount. In Dublin, in 1866, the co-efficient of invasion was about 0·90; in the Hardwicke Hospital in that year it was 1·43, but if the whole population of the three hospitals of the House of Industry were taken, the co-efficient of invasion amounted to 0·45 per cent., showing a very important bearing on the question of contagion or non-contagion; because it showed that in a population peculiarly exposed to influences that might be supposed favourable to the propagation of cholera by invasion, the tendency to spread to individuals was 0·45 per cent., which was less than half the co-efficient of invasion in England in 1849, and considerably less than that which the disease exhibited for the total population of Dublin, which reached 0·90. There was admitted to the Richmond Hospital a patient with fracture of the humerus, who developed cholera, was removed to the Hardwicke Hospital, and died, but the disease did not spread within the walls of the Richmond; there was constant intercommunication between the attendants of all three hospitals. It would be seen that while generally the mortality and co-efficient of invasion were high in the city during the epidemic, the co-efficient of invasion was certainly low in the hospitals taken altogether. It might be asked, were we at the beginning or at the end of a great cholera wave? In his opinion, we were at the beginning, or rather in the interspace between two great waves. What was the practical lesson they should derive from this? He should say, in broad terms, sanitary agitation or agitation for sanitary reform in the city. Much had been done in this way, but a vast deal more remained to be done. What lesson was to be derived from the result of the admission of cholera cases into the general hospitals? He believed the results showed that it was useful, and at the same time safe for persons suffering from cholera to be received into the general hospitals, and that it was

greatly to be desired that facilities for their reception into all general hospitals should be increased, and furthermore, that local hospitals for the treatment of the disease should be established, as far as possible, with a view of having patients received at once and treated immediately. Dublin was a natural home for cholera, and much remained to be done to render the city less liable to the invasion of the disease. Our river required to be cleansed, our sewers to be attended to, our streets to be purified, and better provision made for the disposal of our household and domestic sewage. He thought there was a great deal of valuable instruction to be derived from the hospital reports which had been read. They showed in a logical manner against the conclusion that the disease was capable of being spread by contagion, and furthermore, that contagion must be necessarily excluded if we take into account the argument which the time at his disposal would not enable him to develop, to be drawn from the co-efficient of invasion of the disease, as exemplified amongst our own population, or the special and limited population of the hospitals, and as compared with the spread of the disease in other circumstances and in other towns. With regard to the question of contagion, they must argue logically from contagion to quarantine. Now it had been fully established that quarantine was totally incapable of excluding the disease ; it would over-leap all the bounds which quarantine in its most stringent form had been able to establish in the shape of a cordon. Quarantine meant exclusion, stoppage of commerce, passenger and other traffic, and would be quite impracticable in these countries. Fancy a gentleman coming over here in the Holyhead steamer, and finding the police standing on the quays to prevent his free debarcation, which they knew to be so common a means of attempting to check the introduction or propagation of the disease in cities or districts where ultimately epidemic disease of every kind had been known to spread.

Dr. Hayden begged to remind his friend Dr. Lyons of two notable instances of protection afforded by quarantine against the invasion of cholera. During the late epidemic of cholera in the Mauritius, as reported in an admirable memoir, recently laid before the Cork Medical Society, by Dr. Hardie, Surgeon 73rd Regiment, whilst that island was being decimated by the disease, not a single case occurred in the adjacent island of Réunion, which was in the possession of the French, and *protected by quarantine*. Again, whilst the cholera epidemic of 1866 travelled along the European coast of the Mediterranean, it respected Sicily and Greece, both of which were *protected by quarantine*. As regarded the general question under debate, it seemed to him that one of the most remarkable properties exhibited by cholera, in common with all other epidemic diseases, was that of occasionally transgressing the limits that ordinarily confine its operations, and devastating regions far beyond the limits of its endemic habitat. To what is this due ? Is it the result of

a concentration of the specific poison in the atmosphere, to saturation-point, and its consequent diffusion by the convenient channels of outlet afforded by commerce and human intercourse? or is it that the atmosphere of certain portions of the earth's surface, commonly unfavourable to cholera, undergoes, at certain times, and under the influence of some unknown cause, changes favourable to its reception and development, and requiring only the introduction of the specific morbid poison to develop the disease in all its potency? Whatever the opinion upon this subject may be, it is all but certain that cholera is conveyed between distant places *only* by man, and his articles of dress, furniture, traffic, &c.; sir (continued Dr. Hayden), I deem it no less certain that it is contagious, or communicable from the infected directly to the uninfected. The *media*, through which contamination is effected in the majority of instances, I believe to be the air breathed and the water drunk, and containing in either case, in suspension or solution, the specific poison of cholera, which thus finds entrance into the circulation by the lungs or alimentary canal. In regard to water, I believe the communication of cholera through this medium is not so well established as it is in regard to atmospheric air. Indeed, I rather incline to the opinion that in most instances of alleged communication of the disease by the water drunk, the latter, being simply of an unwholesome character, has acted rather as a predisposing than as an exciting cause of the attack. As the question of contagion is that upon which the most marked difference of opinion exists in relation to cholera, I will, sir, with your permission, devote the few moments that remain to me to the discussion of this portion of the subject, reserving for another place the consideration of it in its several departments. It is noteworthy, as bearing upon the subject of contagion, that cholera has never yet been proved to travel faster than man; whereas, in innumerable instances, it has been demonstratively shown to vary with the rate of man's progress. As facts are more convincing than mere assertion, I will take the liberty of submitting to the society the two following examples of communication of cholera by contagion. One of these came under my own cognizance, and for the particulars of the other I am indebted to a medical friend in this city, who vouches for their accuracy:—

Mrs. G., a woman of middle age, and in the enjoyment of comparatively good health, came up to Dublin from a remote part of the county Meath, on the 5th of November last, for the purpose of having her infant, ten months old, operated on for club-foot. She was admitted into the Mater Misericordiæ Hospital on the following day (6th), and placed, with her child, in the female surgical ward. On the morning of the 13th November she was seized with cholera, and at once transferred to the female cholera ward up-stairs, having continued to suckle her infant up to the moment of her removal. She died of cholera on the evening of

that day, the infant continuing unaffected then and subsequently. No little uneasiness was felt lest this woman had contracted cholera whilst in the hospital, and the disease was about to spread amongst the patients generally. The most searching inquiry was accordingly instituted, with the view of ascertaining whether she had been at any time in the neighbourhood of the cholera-wards, in contact with the cholera patients, or in any way, directly or indirectly, exposed to contagion whilst in the hospital. The result was the conviction that no such exposure had taken place ; the woman had not once gone beyond the corridor adjoining the female surgical ward, which is on the second floor, the wards appropriated to cases of cholera being on the third floor, and quite remote from the former. Both wards had separate attendants and implements, and the most scrupulous care was taken to guard against the communication of cholera by those on duty in the infected wards. It is to be remarked also, that the woman G. was the only inmate of the ward which she occupied who was not suffering from disease or accident of some kind, and that the surgeon in charge of her child had no contact with, or relation to, the cholera cases. On the 16th November the husband of this poor woman came to Dublin, and in a conversation with one of the sisters of the hospital stated, that on the night of his wife's arrival in Dublin, she slept in a lodging-house where cholera had recently been, and expressed the opinion that she there took the disease. On inquiry, it was ascertained that the house in which the woman had slept was 20, Greek-street, and that in that house there had been a case of choleraic diarrhea late in September, and in the adjoining house, No. 21, no less than five cases of cholera in September and October, whilst that street (Greek-street) yielded, probably, a greater number of cases of cholera than any other street on the north side of the city. It would, therefore, appear that this woman received the cholera-poison in that lodging-house on the night of the 5th November, and developed it in the hospital during the week between the 5th and 13th November. It is impossible to arrive at any other conclusion than this, and I would respectfully ask the gentlemen who advocate the view that cholera is not contagious, to say, whether, if evidence equally strong had been furnished in regard to the communication of typhus fever, scarlatina, or any other admittedly contagious disease, they would hesitate to declare that the disease in question had been then and there contracted by contagion ? A medical friend, in large practice in Dublin, has furnished me with the following particulars :—An old lady and gentleman, friends of his, came up to Dublin in August, 1849, from a remote part of the country, where cholera had not appeared, in order to spend some weeks at the sea-side ; they took apartments at Blackrock, and on the morning after their arrival my informant was hastily summoned to attend the lady, who was reported seriously ill ; he hired a car at the railway-station to drive him to his

friends' lodgings, on approaching which the driver significantly remarked that a person who had died of cholera had been removed for interment from that house on the morning of the previous day. The lady, who occupied the same apartments as the person who had died of cholera the day before, there being no others to let in the house, had a severe attack of cholera, from which she was convalescent, when her husband communicated to her the startling intelligence that he too was attacked by cholera, in consequence of which she had an apoplectic seizure which carried her off. The husband ultimately recovered, after passing through the stages of genuine cholera, but a servant of the house, who was subsequently attacked, died of that disease. I might multiply examples of this kind, did the time allowed for addressing the Society admit of my doing so.

Dr. Moore, F.K. & Q.C.P., said that during last Autumn he was engaged with Dr. Kennedy in treating cases of cholera in Sir Patrick Dun's Hospital, and his idea was to check the diarrhea as the best way of dealing with the disease in the first instance. If all cases of vomiting and purging, without cramps, were excluded, the per centage of mortality would have been much greater. He found the mortality in the Hardwicke Hospital was sixty-six per cent., in Dun's Hospital forty-seven per cent., and in the cases which occurred under Dr. M'Donnell, the mortality was under fifty per cent. He asked how was this to be accounted for? and he found on inquiry, that it occurred exactly in the way he had expected. The provision made for the epidemic of cholera, under the Poor Law administration, completely fell through. On the south side of the city twenty-eight beds were open for cholera patients. A rush of cholera came on. Eight beds additional were opened in Dun's Hospital; but there was a limit to this, and the result was that the accommodation provided was insufficient. Cases were brought to the Meath Hospital, but could not be received; they were then taken to Dun's Hospital, but when that, too, was full, they were sent on to the Hardwicke Hospital, where they arrived in a moribund condition. If ever we were afflicted with another visitation of cholera, he believed that if a house-to-house visitation were adopted, all the general hospitals opened, and temporary hospitals established in different parts of the city, the most satisfactory results would follow. He thought what he had stated was a strong argument for the adoption by the authorities of more active and decided efforts, in a sanitary point of view to check the epidemic.

Dr. Henry Kennedy began by saying he was a non-contagionist; and he said so, though aware of the many arguments, some of them very forcible, which had been advanced on the other side of the question, and, more particularly, he must advert to the very elaborate paper, or rather essay, by the late Dr. Graves, which had appeared first in the Dublin Journal, and, subsequently, in another form, had been transferred to the volume of *Physiological Essays*, written by Dr. Graves, and edited

by Dr. Stokes.   Dr. Kennedy thought that, in the consideration of this question, several points had been overlooked.   He then went on to say :—
" Several years back, whilst investigating the subject of epidemics, I was struck by the fact that all those which had traversed a large portion of the globe travelled in the one direction, that is from the east to the west, or from south-west to north-west.   This appeared to me of such importance that I had a chart printed of these epidemics from the earliest records, and brought it before the Royal Irish Academy.   It shows that, ages ago, when human intercourse must have been vastly less than at the present day, epidemics travelled as they have done of late, and of which the cholera in each of its invasions afforded a very good example.   It is also proved that the epidemics affecting cattle travelled in the same way, and the cattle-plague of last year was an example of this kind, having come to Great Britain from Russia.   As an evidence of what may deduced from the chart, I may mention that in the great epidemic fever of 1847-48, it was the fashion to speak of Ireland as being the originator of the disease.   Now this was a mistake. Fever had existed in England far above the averages, and for months before it reached this country.   Nor was this the first occasion on which a similar event had occurred.   But further, and still speaking of the question of contagion, I would observe many seem to think that because an epidemic occurs, it must therefore be contagious.   Two, three, or more cases have arisen in one house, within a brief period of each other, or it may be one room, and the conclusion is hastily jumped at that the spread of the disease, whatever it be, must be due to contagion.   Now, on this point, I would ask—Is not the occurrence of cases in such rapid succession opposed to any real knowledge we possess of the laws of contagion ?   Have we any reason to suppose that a few hours are sufficient, not only to generate, but to bring into active life, such a disease as cholera ?   Are not the cases too frequently simultaneous ? and will they not thus prove more than even contagionists demand ?   In support of these views I would further mention a fact with which all who have had charge of a large hospital must be quite familiar. I mean the sudden appearance of a disease in a single night.   Thus, three or four cases of erysipelas will occur within a certain twelve hours, or an invasion of laryngitis, or otitis, or pneumonia, or a number of the patients will be found worse on the same morning, when there was every reason to have expected the contrary from their state the previous day.   All these considerations and facts—and they could have been easily added to— have ever led me, when speaking of the contagion of cholera, to look upon what I would call negative evidence as by far the most important which could be adduced on the question.   Now, of this kind of evidence there are, I believe, more numerous facts than have ever been brought forward about any other disease, in which the question of contagion

arose.   By far the greater number of those who have seen the disease in India are non-contagionists, and the scale on which they have seen the disease entitles their opinions to the greatest weight.   Again, the late Dr. G. Kennedy told me he had been sent down to Galway in 1832, and that if ever an opportunity offered when contagion might have been expected to have played a prominent part, it was then; that the town was severely visited ; and the people taken quite unprepared; that the houses, nurses, and every requisite had to be got at a moment's notice; and yet with all this the nurses escaped. Dr. Byrne, of the Lock Hospital, who was also sent down then, can confirm this statement.   The result, too, of the last epidemic in Dublin also bears out these facts, for the attendants at the several hospitals may be said literally to have all escaped. Neither can I omit noticing the fact that cholera, of all diseases, brings the nurse and the patient into the closest contact.   If cholera be contagious, it is little short of marvellous to explain how so many escaped. When epidemic fever visited us in 1847-48, every new nurse at the Cork-street Hospital, where some six hundred beds were open, took fever within a month of their appointment.   Before sitting down, sir, I wish to say one word in reference to the treatment.   I believe a mustard emetic to be often a very valuable resource ; and I think I have had enough of experience to enable me to speak with some confidence on the point.   Want of time, however, prevents my giving my reasons for this mode of treatment, which, of course, is not new.   In conclusion, I wish to speak of two points bearing on the prognosis.   Every one who came in contact with cholera must have met cases where the question of life or death became a very difficult one.   They were usually pulseless cases, as far as the wrist was concerned, and they would live in this state for many hours, or even days.   In such I observed that, if they were going to die, puerile respiration declared itself, and seemed then to be a sure precursor of death ; and, again, I found that one of the sounds of the heart would, under similar circumstances, be lost.   Contrary, however, to your observations, sir, on the heart in fever, it was the second sound that was lost, as, indeed, the most plausible explanation of the fact would lead us to expect ; for, I believe, both the state of breathing I have spoken of, and the loss of the second sound were directly due to the state of the blood in these patients.   It had ceased to circulate, or nearly so ; and, as long since shown by Sir D. Corrigan and others, the valvular sound of the organ, that is, the second, must necessarily then be lost."

Dr. Davys said he had come there to hear if there had been any new and efficient method discovered of treating cholera.   He had heard a great deal of statistical facts, which he might have obtained from the returns of the Registrar-General, and he had heard some discussion as to whether cholera was contagious or non-contagious, but except what fell from Dr. Moore, he had heard nothing as to the treatment of cholera.

No more dreadful scourge had ever visited this country. In his own district, from the 7th to the 29th September, there had been at least thirty cases. He had seen it attack persons in a good condition of life, and persons in humble circumstances, and if more than ten minutes were allowed him he could prove that cholera was contagious. But what he wanted to know was, whether there was anything new in the treatment of cholera? He himself had tried with cholera patients everything he had heard of, and in no three cases had the same method of treatment succeeded. He had tried castor oil and found it good on some occasions, while it failed on others. The ordinary mustard emetic had succeeded with some and failed with others. He therefore hoped to hear something of importance as regards the successful treatment of the disease, which he regretted to learn was, in the opinion of Dr. Lyons, likely to revisit this country.

Dr. Laing, Staff Surgeon-Major, said he was stationed in Kurrachee, in Scinde, in the month of June, 1848, where all communication was cut off by sea from all parts of the Continent, and little communication by land existed. Cholera came on on the 14th of June, and in the first twenty-four hours 100 men came into hospital. It appeared as if a cloud came across the sun, and at six o'clock that evening the men began to come into hospital, and before seven o'clock there were thirty men lying dead. The disease went on for ten days, and in that time they lost 240 men. He ought to have said that no rain falls in that country; the dew point was very high, there was very little difference in the wet and dry bulb, and there was a constant breeze blowing from sea which kept the air moist. The regiment he belonged to had had a great deal of hard work, and had returned to this place, and were in tents when the epidemic broke out. The other regiments suffered not so much, but they lost a good deal of men also. The men suffered dreadfully, but of the officers in the cantonment only one was attacked, and he recovered. Another officer on the station was attacked and died. The atmosphere was most oppressive. It was a remarkable fact that the brahimine, kites, and crows, which collected about the cantonments to pick up the offal, disappeared altogether, and did not return until all the cases of cholera had ceased. The domestic fowls about the cantonment died, and he was told that the sheep in the neighbourhood suffered severely. The disease left them and went up the River Indus, and gradually appeared to lose itself in the upper country. The dak-runners were stricken down on the road, and found lying there dead. Every mode of treatment was tried. In the first thousand cases of disease there were seventy or seventy-five deaths, and as the disease proceeded towards its termination the mortality diminished. He had since observed the disease in Bengal, and it broke out there under different circumstances. It

appeared about three weeks after the monsoon. The rainfall at the beginning of the monsoon clears the atmosphere, and a fortnight or three weeks after the rain ceases to fall, the air becomes close and oppressive, and it was then they looked out for the appearance of the disease. The moment a case of cholera or diarrhea appeared, the regiment was moved across the Jumna river, and not a single case of cholera occurred in the six companies, which were thus moved. Diarrhea, he was perfectly certain, ought to be counted as a concomitant of cholera. He thought every case of diarrhea, during the prevalence of a cholera epidemic, ought to be regarded as a case of cholera. He thought the principle acted on in removing a regiment from the place in which it was attacked with the disease might be taken advantage of in Dublin. If an outbreak took place at Donnybrook, for instance, if the whole population were moved out of the place, it would save many valuable lives. He approved of the primary treatment of diarrhea by opium and astringents. When purging came on with suppression of urine and rice-water evacuations, he had found dashing with ice-water to have had more effect than anything he had seen used in the disease.

Dr. Quinlan said he believed that a great many officers who had served in India, and had experience of cholera on an extensive scale, were of opinion that it was not contagious. Now, as there were several army medical officers of Indian experience present, it would be desirable if they would favour the meeting with their views upon that subject.

Dr. Haverty, 52nd Regiment, observed, that from what he had seen of cholera in India, he was strongly impressed with the belief of its non-contagious nature. He had nothing to bring forward in the way of statistics, but he had directed his particular attention to that point, and such was the conclusion at which he arrived. In the treatment of cholera cases he always had the aid of the men of the different companies which were attacked with cholera to wait on the patients, and he could not adduce a single instance of a man having taken cholera who had attended on a cholera patient as a nurse. It had been observed a few minutes ago that the nursing in cholera was different from that in any other disease. The men were constantly and closely employed; they were brought into immediate contact with the patients; and if cholera were contagious, one would suppose these were the very circumstances under which the contagion would spread. Yet, so far as his experience was concerned, the contrary had been the case. He had seen instances of the extremely eccentric way in which cholera travels. On one occasion cholera existed in a place within sixty miles of where his regiment was stationed, and swept the country in the immediate neighbourhood, and carried off a great number of people, yet it did not touch the cantonment in which he was, although there was a high road between the two places, and constant communication kept up. In the next year cholera attacked

the cantonment where he was, and left the city at the distance of sixty miles, and although people were constantly passing from one place to the other, no case of cholera appeared in the latter. Atmospheric influence was much talked off as a means of conveying the cholera in India. In the instance to which he referred the wind was in a direction favourable to the spread of the cholera from place to place, yet the disease passed by some places, and made a jump as it were of sixty miles to another locality. As regarded this cantonment of which he spoke, about ten days after the outbreak took place the troops were moved to a distance of about six miles from their former position, and there also the cantonment was on the high road, about eight miles from a city, where the wretched natives were dying by hundreds, and, it was said, by thousands. The cholera ceased in two or three days after they removed to that locality. Some few cases occurred within twenty-four hours after their removal, but it was probable the men had brought the germs of the disease with them. The disease, however, ceased to spread, and all the time the wind was blowing towards them from the city where the cholera was raging, and there was a constant intercourse kept up with the natives. As regards the treatment of the disease, he was always in the habit of saying that nursing was the only thing for it. He still knew of nothing so effectual as constant attention, the introduction continually and cautiously of nutriment and stimulants, and friction with counter-irritation. It struck him as extraordinary, if the preliminary stage of cholera were ushered in by diarrhea, why there should be strong advocates for the use of purgatives. He should have thought that their great object would have been to check anything in that direction. Their great object was to get hold of cholera in its early stage and put a stop to it, and they were successful in doing this. How purgatives could be advocated, under these circumstances, he was at a loss to understand. Mustard emetics were spoken of as being very useful, but when their object was to check purging and vomiting, he did not see why they should try to induce vomiting by giving a mustard emetic, or any other emetic.

On the motion of Sir Dominic Corrigan, seconded by Dr. Lyons, the debate was adjourned until the following evening.

Third Night's Proceedings, April 5, 1867.

The debate was resumed on Friday evening at half-past eight.
The President of the College in the Chair.

Sir Dominic Corrigan, having been called on by the President, observed that there was one very gratifying feature in their debates, namely, that they came there to elicit truth, not to support their own opinions, and he was sure there was not a man amongst them who would not sacrifice his opinions if he were convinced that those opinions were wrong. The first

matter he wished to direct their attention to was the map of Ireland which he had placed before them. It represented Ireland, divided by a line from North to South, rather an unusual division. All the towns that were visited by the epidemic of 1848, '49, and '50, were marked black— that is the towns of 2,000 inhabitants and upwards, for they were obliged to put some limit to the returns. All the towns not visited were marked red. A very remarkable circumstance, for which he was not prepared, was that, on the left-hand side of the line—that is, the western side of Ireland—there was scarcely a red dot, while, on the right-hand side, they were in large proportion; and the proportion was this, that in Ulster one-half of the towns escaped, in Leinster one-fourth of the towns escaped, in Munster one-eighth of the towns escaped, and in Connaught not one escaped. He was struck by this remarkable fact, that those portions of Ireland on the right side of the line, where there were manufactures, trade, commerce, industry, roads, and railways, presented a congeries of towns, of which from one-eighth to one-half escaped the ravages of cholera; while, in the West of Ireland, where there were no manufactures, no commerce, few railways, and little intercourse, not a town escaped. This was a remarkable fact, and he alluded to it in reference to a discussion which took place on cholera some time ago, when Professor Haughton stated that he was nearly converted to his (Sir Dominic Corrigan's) view, namely, that contagion was not an all-powerful influence in spreading the disease, were it not that he was convinced that cholera was brought to the West of Ireland by the reapers who caught it in England. He would not dwell further on this point than merely to narrate some facts, which would sufficiently show that these poor men did not, in addition to their other misfortunes, carry cholera on their backs; and having shown that, he thought he would be entitled to claim the gentleman to whom he referred as a supporter of his views. On looking to the report from which that map was taken, he found that the first appearance of cholera in Connaught, in the year 1849, was on the 7th of February, and that visitation extended through the intervening months to September of the following year. The cholera broke out in England in 1848. Now, the Connaught reapers who went to England in 1848, returned to their own country about July or August of the same year. The first outbreak of cholera in Connaught was in February, 1849. Taking those dates into consideration, they should then be forced to the conclusion, if they admitted Professor Haughton's views, that the reapers, having returned to their own homes in August, 1848, contrived to keep cholera as a latent burden until February, 1849. It was utterly impossible to hold that view, and he considered the question of dates to settle the matter— namely, that the Connaught reapers did not carry the disease from England in 1848, inasmuch as it did not break out in Connaught until 1849.

In reference to the influence of contagion, they must take the *pros* and *cons*. He was not an advocate of any extreme doctrine one way or the other in the matter. He would mention some facts which had made an impression on his mind. The police force of Dublin consisted, in round numbers, of 1,000 men. Of these, about 250 reside with their families, and 750 lived in barracks. It was an instructive fact that there were only eight cases of cholera among those thousand men, and of these six occurred in barracks, and two of policemen residing in their own dwellings. Now, of all the men in Ireland who were exposed to cholera, whether from their duties in places where cholera prevailed, or their contact with the sick poor and criminals, there were none more exposed than the police, and yet, out of 1,000 men, there were only six cases of cholera, and four of these occurred in suburban districts. Again, take the workhouses. Dr. Minchin informed him that the North Union Workhouse contained about 2,000 inmates. How many cases of cholera occurred in that workhouse during the late epidemic?—and let it be recollected that the inmates of a workhouse were perpetually changing, and of all places a workhouse was, therefore, peculiarly exposed to the chances of contagion. Only two. He might mention another curious fact. Impure water had been much and often dwelt on as a cause of spreading cholera, and yet here is the description of water used in the North Union Workhouse, in which only two cases of cholera occurred, given in the January number of *The Medical Press* of 1840, by Dr. M'Donnell, Poor Law Commissioner:—" A year and a-half ago I saw the basin emptied for the purpose of cleansing it. It is not possible by description to convey an adequate idea of the abominable compost, from one to two feet deep, that formed the bottom of it. Gay's cloacina might, without regret, have deserted fleet ditch to wallow in its more congenial filth." He (Sir Dominic Corrigan) could fully corroborate that statement. The supply is still from the same source; and he mentioned it to show how cautious they ought to be in taking up water, contagion, or anything else to account for the spread of cholera. The village of Kilcock is full of beggars, and surrounded by bogs. In that village, from 1832 to the present time, a case of cholera has never appeared. If they turned to the clergy, a class much exposed to the influence of cholera, what did they find? Of the Established Church there were in Dublin seventy-six clergymen, and of the clergy of the Roman Catholic Church 137—making, in round numbers, 200. How many of them died of cholera? Not one. Of the medical profession, physicians to workhouses and dispensaries, how many died? Not one. If they turned to Sir Patrick Dun's Hospital they found that not one died. Among the authorities connected with that Hospital there was one who had given himself heart and soul to the work of caring the poor, and had exposed himself without intermission to all the dangers of cholera—Professor Haughton. He did

not die (laughter and applause) : not one of the physicians of the Hard-wicke Hospital, or of the Mater Misericordiæ Hospital, died ; and not one of the Sisters attached to the latter institution, who bent over the dying, and devoted themselves so assiduously to attendance on the sick, caught the disease. Dr. Hayden had adduced two cases as evidence of the para-mount influence of contagion. One was that a man said his wife had been in a cholera lodging-house. Now what a cholera lodging-house was he really did not understand ; but he would ask his friend to remember that in estimating what was contagious and what was not, if they de-rived their information from one or two cases only, they might be led astray. He thought if his friend Dr. Hayden would consider the ques-tion again, he would, perhaps, not come to such a positive conclusion from two cases. The other case which he adduced was where a man de-rived his information from a cabman. Admitting the facts to be true, he submitted they were not sufficiently conclusive to found upon them the theory that cholera was eminently contagious. Suppose a man tried to relieve a friend who had got lumbago by rubbing him, and that he got lumbago, it might be said he got it from contagion. He adduced this to show that, in coming to a conclusion as to contagion or not, they could not derive a satisfactory conclusion from one or two cases, but must draw their inference from an immense number of facts. It was the only way in which they could avoid error. If one thousand cases of lumbago occurred from attending lumbago patients, then, indeed, they might say that lum-bago was contagious, but they could not come to such a conclusion from one or two cases only. Dr. Hayden had alluded to the Island of Réunion and to Greece ; but from his experience he could say, that of all the countries in Europe in which it was impossible to carry out anything, Greece was entitled to the palm, and as for carrying out quarantine in Greece, the thing was utterly impossible. The officials were most cor-rupt, and he was told at one of the ports that if he paid a drachma to the custom-house officer, he might pass in anything he liked from Beelze-bub to Black-death (laughter). In the Cyclades, islands of Greece, there were ports frequented by steamboats from all parts, and there were to be found Copts, Egyptians, Turks, and the nastiest set of human beings he ever saw. It would be perfectly impracticable to carry out quarantine there, and in fact it ·was not carried out in Greece. The conclusion he would arrive at, was not to take an extreme view of the question. He did not feel himself authorized to say that cholera was, or was not, con-tagious. He believed almost that any disease might become contagious. What he desired to convey was that contagion in cholera was an element far less powerful than in scarlatina or typhus. If they adopted the other view, and held that contagion was so powerful an element that our hospi-tals were to be closed against cholera patients, they would do a great deal of harm to mankind, both in its social relations and in its maritime

interests.   They should, he thought, look on cholera as a disease in which contagion might become an element, but its contagious nature had never yet been demonstrated.   They would commit a great error if they elevated contagion as an influence beyond all others.   The practical view he would adduce was this—that when cholera came among us it should be treated as any other evil; that even admitting it was contagious it was less so than scarlatina or typhus.   A gentleman, for whose opinion he had a great respect, said he had been disappointed, that he had come there to listen to some improvement in treatment.   Now, he looked on the debate, so far as it had gone, as the greatest compliment that could be paid to the Dublin School of Medicine—that it was eclectic; and he thought the great compliment to be paid to it was this, that it had not been lowered as other societies had been, by men coming forward and saying that they had discovered this, that, and the other thing as a cure.   There was one argument he had often heard put forward, that cholera must be in the air, or in the water, or in the earth, and if it was not in the air inhaled by our lungs, it must be in the water taken in by our digestive organs. But did we know all the powers in nature?   Might there not be some which we did not know and could not understand?   It was within his own recollection that there was a time when we only knew with regard to light that it contained the rays revealed by the prism.   Now it was known that there were actinic rays, calorific rays, and magnetic rays.   A few years ago we knew nothing of ozone, iodine, and bromine.   It was better for them therefore to say that as yet they knew not the cause of cholera, than to presume to come forward and say they had arrived at certain knowledge.   Let them hope that by observation and reflection, by steadily cultivating those faculties which Providence had given them, they might ultimately arrive at the knowledge of the mysterious powers by which this disease, like other phenomena, spreads itself over the world. (Applause.)

Mr. J. S. Comyn, Assistant-Surgeon Royal Artillery, said—As an Army Medical Officer, and an old pupil of Sir Dominic Corrigan, he would say a few words with respect to his experience of cholera abroad. He was quartered at Malta during the epidemic of 1865, and he had been constantly placed in positions half-way between India, where cholera was endemic, and this country, where it paid periodic visitations.   He thought the Military Medical Officers who had spoken of cholera in India had described correctly the state of things there—that the disease struck localities, and that one passing through them was liable to be attacked by it; but in other places he thought that it travelled by human inter-course, and was conveyed by contact.   In Malta, in 1865, he had charge of a brigade of Artillery; they were quartered, women and children as well as the men, close to the Lazaretto of Valetta.   About the middle of May there was a great alarm of cholera, and towards the end of the

month the Maltese who lived at Alexandria began to pour into Malta. No cordon was established until the 14th of June, and on the 22nd of June Medical Officers were attached to the Lazaretto. They did not know, therefore, the exact commencement of the disease, for it was admitted that it might have been introduced by the choleraic diarrhea, which might have been brought in by those persons. The first case broke out among his own regiment. On the 20th of June, a child was attacked, and died. On the 21st of June he saw another patient. They were taken from a place adjoining the Lazaretto, which had been assigned to the married people, and which was badly drained and unhealthy. The disease occurred in six cases. On the 28th of June, eight days after the outbreak, for there was at first a difference of opinion among the officers whether it was cholera or not, he reported that the battalion should be removed to a long distance. This was not done until the 1st of July, and instead of being removed to a distance they were taken to Valetta, when five were attacked. A woman attending some of the patients was struck down by cholera. A few days after her death her child was sent to Valetta; one of the people who took care of the child died, another was attacked but survived. Another person living within a few yards of them caught the contagion and died. The disease went into the house of an officer, whose wife and maid-servant took the disease, and the latter died ; and, although cholera had not broken out last year in Malta, yet in that very house a case of cholera, in all its symptoms similar to the others, except in the immediate danger of death, took place, and was attended by him. With regard to India, Malta, and Dublin, the disease seemed to exist under different conditions. At Malta and other places to which it did not naturally belong, he believed it was carried from one person to another. The case of Sicily afforded a strong proof of this. There was no cholera there in 1865, when vessels coming from other parts were rigorously excluded ; but last year the disturbed condition of the island obliged the Italian government to send troops into it, and the introduction of cholera was the result. With regard to the introduction of the disease into Gibraltar he might say a few words :— The 22nd Regiment started from Malta for Gibraltar, on the 6th of July, six days after the cholera had been duly reported by him. Fourteen days after that the first case of cholera occurred in that regiment, and spread from it through the town. Of twenty-six Medical Officers who were present there, many of them men of long Indian experience, he did not believe that one was a non-contagionist. His experience was that men well nourished, young and strong, were not so liable as others to the disease, and might attend the sick with impunity, as did the Medical Officers ; but the weak could not do this, and more readily caught the contagion and succumbed to the disease. The families of the married people among the Artillery suffered severely, and the Maltese suffered

much because they were a people living on a low diet.   They found that
where the air was pure and the apartments large the disease did not stop.
In the General Hospital of Valetta only one case arose, although they
were constantly introducing the disease.   They burnt the bed-clothes,
and adopted other measures to stamp it out, and he believed it could be
stamped out in these countries, although not in India.   The measures
which he would venture to suggest ought to be adopted in this or any
other country to which the disease was conveyed by ships were, that
there should be a port assigned for receiving vessels from all suspected
places, and that this port should be under the surveillance of the police,
who should be charged with the duty of carrying out the regulations
made for the landing of passengers.   With regard to the Ionian Islands
and Greece, he fully agreed with Sir Dominic Corrigan, that quarantine
was not carried out there as it ought to be.   But in Malta last year
1866, quarantine had been properly carried out, and not one case found
its way into the Island, notwithstanding that it raged all around, and
that the embers of cholera remained; for, as he had already stated, in the
same house in which an officer's wife had sickened, and her servant had
died, a case occurred last year, corresponding in every respect with those
cases, except in the immediate danger of death, and some similar cases
occurred in Malta in 1866.   In India he believed the disease did not
require contagion to spread it; here it was different, and we had no
excuse for not managing it as the cattle-plague was managed in England,
and still more creditably in our own country.   (Applause).

Dr. Head wished to bring under the notice of the meeting an instance
in which cholera seemed to have been propagated by contagion.   On the
map before them the town of Portaferry, on the north-east coast of
Ireland, was indicated by a black mark; within three miles of that town
there was a little village called Cloughey.   No case of cholera occurred
nearer to that village than Dundalk, except a few cases that occurred in
Belfast, and at the time the disease appeared in the village, there was no
case at all in Belfast.   There was a fishing-boat which belonged to
Cloughey, and which had been fishing off the coast of Dublin, near
Skerries or Balbriggan.   A boy on board, the son of the captain of the
fishing-boat, took ill; the father would not put him ashore here, but
sailed to Cloughey, where the boy was put ashore and died; the father
took cholera and died, and one of the persons into whose house the boy
went also took cholera.   There were thirteen cases of cholera altogether
in that little village, and eight died.   A nurse was sent from Belfast to
take charge of the patients, and she took cholera.   These cases of cholera
occurring in that village were distinctly traced to the fishing-boat.   It
was difficult to explain the outbreak of cholera in that remote and iso-
lated locality, except on the theory of contagion.

Dr. Mapother said he would not have addressed the meeting except

that the explanation of the disease which Pettenköfer had given in 1854, and which had been accepted by the first British and Continental pathologists, was not alluded to by any previous speaker. Personal enquiry in this city, Liverpool, Arklow, and other provincial towns, had convinced him of the truth of this explanation. Three things must concur for the spread of cholera—1st. The importation of the germ. Any one who considered the history of the first Dublin cases, the first Arklow cases (detailed in his " Lectures on public health "), or the statement of the Registrar-General and Dr. Burke, that in nearly every one of the thirty districts attacked, the first cases had been in the persons of individuals coming from places where cholera was present, could scarcely doubt the portability of the disease. The progress of the contagion in the persons of the Dutch emigrants to Liverpool, to the steamship *Helvetia,* in which the disease broke out while off Queenstown, the authorities of which, in a barbarous manner, refused all aid ; its return to Liverpool, and importation to this country with something like retribution, must be convincing. The second item is residence over ill-drained places. While small-pox is due to a pure contagion, and ague to a miasm, cholera requires both agencies for its production. Pettenköfer cites the following instance in proof :—The ship *Carnatic* lay for many days outside Madras, the sailors being frequently in that town. The soldiers whom she was to convey passed directly through the town, and embarked. In four days all the sailors were attacked with cholera, while not one of the soldiers suffered, although they assiduously nursed the patients. To show the connexion between the disease and ill-drained, excrement-soaked places in this city (continued Dr. Mapother), I marked on a large map the houses in which every death by cholera had occurred, and then traced in the streams which, according to Speed's and Rocque's maps, were extant in 1610 and 1756, such as the Tongue, the Bradogue, the Hoha, the City ditch, &c.; and nearly all the cases corresponded to such obstructed and forgotten streams. That third point is, that some persons are more likely than others to catch and die by the disease ; the ill-fed, the drunken, the unwashed, the ill-aired, whose blood is loaded with unhealthy fibrin ; infants in whom that material abounds from the absorption of temporary organs, and the old, whose wasting tissues throw it back upon the blood, suffer most, and most fatally, as there is more pabulum for zymosis. Thus I would explain the cases of the wretched Connaught men and the fortunate policemen, so forcibly contrasted by Sir D. Corrigan. I may announce that Mr. Radcliffe's experiments for the Privy Council, just completed, prove that rats and mice take the disease if dosed with choleraic fæces, between three and five days after their ejection. As it has been stated that Indian experience is against contagiousness, I beg to refer to Mr. Orton's work, the fullest and best ever published on the disease, although issued in 1831, and to many of the late reports to the

Epidemiological Society.   A few words about treatment : While quinine cures ague (which it probably does by supplying a deficiency of quinoidine, a natural component of ours), the search for an antidote to the cholera poison can never be hopeless, and when malaria, which has felled scores of times as many victims as cholera, has been almost banished from these countries, we must also regard the latter pest as exterminable.   I gave Calabar bean to patients in cholera collapse, as it is a direct sedative of the sympathetic system, which, I think, in that pathological state, as well as in the collapse due to a crushed limb, or to fear, is excited.   Such is indicated by the dilated pupil and contracted capillaries, which produce the cold surface, the shrivelled fingers, the sunken eyes, and pinched features.   Such promising agents as strychnia, warm-water packing, or rolling in cotton-wool, act indirectly as sedatives of the sympathetic. According to the reports, it appears that of eight patients in collapse who took Calabar bean, five recovered, three died—a ratio which acquits my experiment of any homicidal result.

Dr. Cruise said, as the question of contagion or non-contagion in cholera was immediately before the meeting, he thought it only right, in justice to himself and his colleague Dr. Hayden, with whom he had attended a large number of patients at the Mater Misericordiæ Hospital, to mention some facts which led him to the opinion that cholera was contagious and propagable by contact.   It was quite true, if they took individual cases, they were liable to the accusation of arguing *a particulari ad universal* ; but, he thought, if they examined all the cases carefully, they would find but few in which they might not trace a fair probability of contagion ; in other words, he believed that, in many instances, a belief in non-contagion was due to insufficient information.   He was called on in the latter part of October to see a clergyman in Clondalkin.   He saw him at four o'clock in the afternoon ; he was then collapsed in cholera, and died that night.   This clergyman had been called upon the previous night to attend a woman in cholera.   He remained with her two hours, returned to bed and fell asleep, awoke ailing in the morning, sickened about eight o'clock, and had such marked symptoms that it was necessary to call in Dr. M'Crea of Clondalkin.   He pronounced the case to be one of cholera, and prescribed accordingly.   The woman's history was as follows :—She had a brother living at Kingstown, who had been seized with cholera and died there.   She went to Kingstown to attend the wake, remained there three days, returned to Clondalkin, took cholera on that day, and died on the day following.   It might be chance that caused this woman to take cholera, and chance that caused the clergyman who attended her to take cholera also, but the coincidence was, at least, very remarkable.   A young woman was admitted to the Mater Misericordiæ Hospital with her child labouring under cholera.   The woman recovered, the child died.   What was the history of this case ?   The young woman

lived in the county of Kildare. She had a single child, which she placed at nurse in Cork-street. She heard that the nurse with whom she had placed the child was ill, and came up to town to see after the baby. She found the woman ill of cholera. She removed the child to a street off Marlborough-street, where they both took cholera, and were sent a few days after to the Mater Misericordiæ Hospital. He admitted that this might be all chance; but it was possible to entertain an opposite opinion. Several gentlemen who had had large experience in India said that cholera was not contagious. To their opinion the utmost respect was due, because their opportunities of observing cholera were much larger than we possessed in this country. Nevertheless it was right to state that opinions differed with regard to cholera in India. When attending cholera cases last year in the Mater Misericordiæ Hospital he met a fellow student of his own, now a distinguished surgeon in the Indian army. He asked him what was his experience of the disease in India, and he replied that it was looked on as decidedly contagious; that there was the utmost reluctance on the part of the men to attend on the cholera patients, and that there was almost a mutiny in his regiment from the enforced attendance on the sick. He said also that a large proportion of men who discharged this duty took cholera, but not one of the officers was affected. A large number of medical students, who displayed so much earnestness and zeal during the epidemic in France, were seized with cholera, and died of it. Referring to the registry of the cases treated in the Mater Misericordiæ Hospital, it would be found that a large proportion of the cases came from houses in which cholera was raging. For instance, a case would come in from Greek-street, and it would be followed within two, three, or four days by others coming from the same house. This might be only chance, but it was only fair to admit that it was not altogether unreasonable to entertain an opposite view. For his part he quite agreed with Sir Dominic Corrigan, that the degree of contagion in cholera was not comparable to that of typhus and scarlatina. But the question of degree was not in point as regarded the question of contagion itself. The fact that cholera had arisen where there was no way of accounting for it by contact, was no proof of its non-contagious nature, for he had seen cases of typhus and scarlatina arise under similar circumstances. Neither would he admit that the non-spreading of the disease was a proof of the non-contagion theory. In the Mater Misericordiæ Hospital not a single case arose from spreading within the walls of the institution; but it was right to state that the hygienic measures adopted there were extreme. He might quote the statement of Dr. Stokes in reference to typhus, that there had not been one case of the spreading of that disease from the fever wards of the Meath Hospital to the cholera wards. An instance occurred under his own observation, where a child was sucking when the nurse was labouring under malignant

typhus, yet the child never showed a symptom of the disease. No one, for this reason, would venture to say that typhus was not highly contagious. In his opinion, if they carefully investigated all the cases of cholera, they would find sufficient reason to believe that it was propagable by contagion, although not nearly so virulent as typhus, small-pox, or scarlatina.

Dr. Murrogh, H.M. Madras Army, said that he had served twenty-two years in India, and had had much experience of cholera, and that he never saw a European or a native soldier hesitate one instant to attend on his comrade who was stricken down with the disease. He made it a rule to ascertain whether the soldiers called on to discharge that duty had any fear or timidity with regard to the disease, and he had never met with an instance of the kind. His experience of twenty-two years in India had taught him that cholera was not in any way propagated by contagion. He had seen thousands of cases of cholera; he had attended it in the camp and in the field, and he had the disease very severely himself, but he did not get it from communication with the sick. He got it at a time when there was not a single case of cholera within a hundred miles of where he was stationed, and he attributed it to having drank three or four glasses of sour claret (laughter). He had been exposed to contagion as much as any man could have been, but he did not take the disease in that way. He remembered two of his apothecaries being struck down. One of them was a very timid lad, very nervous and apprehensive of the disease; he was very zealous, exerted himself too much, and became greatly debilitated, and sunk under the attack. The other recovered. He thought all the medical men of experience in India would coincide with him that cholera was not contagious. Previous to his going to India he had experience in cholera. In 1832, when the epidemic was in Edinburgh, he was a volunteer in the hospitals there. After taking his degree he was employed under the Cholera Board in this country, and he attended cholera in the counties of Waterford and Cork. He went to India a confirmed contagionist, if ever there was one, but in that country he saw no preparations for a contagious disease. Every man who was attacked was at once sent into hospital, just as if he had a broken leg, and the disease was never communicated from bed to bed. It took him some four or five years before he got rid of the idea that cholera was contagious. As to the young gentleman from whom Dr. Cruise derived his information, he was probably ignorant of the Indian language, and did not know what the natives said to him. The native soldiers were most affectionate to their comrades. He never saw a native soldier refuse to attend his fellow-soldier; in fact, there was a religious feeling among them on the subject that would render the thing impossible.

Rev. Professor Haughton said his friend Sir Dominic Corrigan had

done him the justice to say that he was willing to die in the cause of cholera, but he seemed rather to complain that he did not die (laughter). Now, whatever little service he might have rendered in the cholera epidemic, he did with the full resolution under no circumstances to die (laughter). But, at the same time, he was willing to confess that if he had ten lives or twenty lives he would gladly lay them down to help the poor. He would say in the words, not of a christian, but of a pagan — *Homo sum, humani nihil a me alienum puto* (applause). He should be sorry to deprive the friends and relations of the good priest described by Dr. Cruise of the mournful consolation that he died as a good clergyman should, with his eyes open to the danger he incurred, and in the brave discharge of his duty. He was free to confess that the production of the map now before them was due to the suggestion of his friend Sir D. Corrigan. On the former occasion, to which allusion had been made, he was greatly struck with Sir Dominic's cholera map; it seemed to him a most valuable contribution to the cholera epidemic in 1849; it contained a valuable record of the towns that were attacked by cholera and that escaped it, but it was not accompanied with any explanation as to how a certain set of towns acquired the cholera, and how another set of towns was exempted from it. In the pamphlet which accompanied the map Sir Dominic Corrigan threw out a suggestion as to the reason why the eastern towns were exempted from the disease, while the western towns were subject to it. This was a mere guess, and as he (Professor Haughton) was equally entitled to make a guess, he ventured upon one, and the unfortunate reapers came into his head. He wanted to supply, if possible, a clue to Sir Dominic Corrigan's map. He presumed now, from what they had heard that evening, that the poor reapers were blamed unjustly, and that they did not carry the cholera from England to Connaught. But he thought Sir Dominic Corrigan's map was no longer a puzzle. He ventured to say that the map he had constructed of the cholera epidemic of 1866 gave the key to the older map of 1849, which would prove of the greatest possible value to medical science. He started with a general feeling in favour of the contact theory, but with a determination not to allow himself to be influenced by that view in opposition to facts. The result of his inquiries had been the map before them, and he had evidence to show that nearly every town which was marked in black as having been visited with cholera, had derived it either directly or indirectly from the town of Liverpool, and there were only a few towns on the map—Parsonstown for example, which derived it from Sheffield, and Westport, to which the contagion was carried by sea, from South Wales—which were not indebted to Liverpool for the disease. Cholera entered Ireland at four points by sea: Belfast, Dundalk, Drogheda, and Dublin. Dr. Head had stated the remarkable circumstances connected with the outbreak of the disease in the little village of

Killoughter in the North. Other towns derived the cholera from Dublin, which was a secondary or indirect importation from Liverpool. He had marked the lines of railway along which the epidemic travelled, and had divided the towns into groups according to the time at which they were attacked. Thus, Dublin was No. 1, Belfast 2, and so on. The disease did not travel in a direct line, as it would if it were conveyed by the atmosphere, but jumped from place to place as it would if conveyed by personal influence. The reason why Mallow suffered before Newbridge was that the cholera patient who brought the disease to Mallow took a ticket for Mallow, and not for Newbridge. If he stopped at Mountmellick he would have brought the disease there, or if he went to Kilcock he might have introduced it into that dirty village, and killed the Kilcockians (laughter). The comparative exemption of Ulster, and the apparently sporadic spread of the disease into the west of Ireland, were apparent on his map as well as in the map of 1849 ; the resemblance between the two maps was great, and the same facts were disclosed by both. He gave his friend Sir Dominic Corrigan credit for more than his usual skill in finding an explanation for the facts. The reason why Sir Dominic thought Ulster was exempted from the disease was, because the people of Ulster are more prosperous, more active in their commercial enterprize, and therefore must be supposed to have more intercourse with each other than the people of other parts of Ireland. Every one who knew intimately the self-reliant people of Ulster knew that the contrary was the fact. Ulster consisted of a series of isolated centres of enterprize. Each man in that centre considered himself superior to every one in any other part of the earth ; he held little intercourse with others, and as to the *Times* he did not believe in it, and it was to be wished that other people in Ireland would follow his example in this respect (laughter). Places like Enniskillen, Strabane, Dungannon, and Omagh were, as he had said, isolated centres of industry ; they had little or no intercourse with Liverpool, they did not go there, they did not care about it, and therefore the same broad fact appeared on his map which was exhibited by the map of Sir Dominic Corrigan—the exemption of these local centres of industry in the North from the disease. As to the spread of the disease into the West, he had got information with respect to its importation into Westport, Ballinasloe, and Kilrush. Dr. Croker King gave him the names of the persons who brought it to those places. In fact, all those cases which would otherwise be regarded as due to sporadic or epidemic influence were explained the moment they obtained the history of the individual cases. He thought this discussion, which had the result of showing that there was less difference of opinion between them than when they commenced, could lead to no more interesting or important result than a demand upon the poor-law authorities to inform them in detail of the opinion of the medical officers employed under them in each

town and district, as to how and when the cholera was introduced into their respective districts. Cholera, and the introduction of cholera, like every other matter of science, must be subject to the rules of severe logic, and as several of the observations made that evening exhibited very lax views on this important subject, perhaps they would allow him to state what he believed to be the correct view of the contact theory of cholera. The contact theory of cholera was based on two hypotheses. The first was one they were all familiar with; there must be, *ab extra*, a materies morbi. For the second term he would propose a new form of expression. Receptivity was bog latin, but he had found an expression in the works of the elder Pliny, who lost his life, in the pursuit of science, at the destruction of Herculaneum, which, he thought, would be appropriate. Pliny, speaking of a friend, described him as capax secreti— one who could hold a secret if you put it into him, and he carefully excluded his wife from that category (laughter). Now he would propose the term capax morbi, which means the capacity of receiving the disease, and the capability of holding it when you got it, as the second hypothesis on which the contact theory depended. If they accepted these two hypotheses, they easily disposed of two classes of fallacies—fallacies of which he believed he had heard a great deal that night. First, the occurrence of cases in which persons were in contact with cholera who did not take the disease. He envied them their luck. They must be very tough, and have magnificent constitutions; and their friend, the army surgeon, who had described his views on the subject so clearly, might be perfectly certain that he was not capable of taking the disease, while more delicate persons were. The secretions of the skin in tropical climates might also have some influence in preventing contact being so dangerous in India as it would be in a colder climate. The second class of cases were those in which genuine cholera occurred in persons who were not in contact with the disease. This was illustrated by the outbreak in Mountjoy Prison; but he was sure his friend Dr. M'Donnell would not press that beyond its legitimate consequence, which was to show how difficult it was to ascertain exactly the origin of the disease in every case. Here they must confess their ignorance, but he would not confess ignorance in general. The contact theory, he submitted, was much more probable than any other that had been advanced. But on two points they were ignorant—they were ignorant of the precise nature of the materies morbi, and of the precise quality of body that constituted the capacitas morbi in the subject. He trusted one important result of their debate would be, that in future they would direct their attention in a more precise manner to trace the particular channel by which the disease entered the body, and the particular condition of malaise or ill health which rendered an individual susceptible of it (applause).

Dr. White said, as one of the medical officers practising in a district

in which a great deal of cholera appeared last Autumn, he wished to say a few words on the subject. The first case of cholera which occurred at that side of the county of Dublin came under his notice. It was that of a lady whom he attended in her confinement, and he could not say, from what he had heard that evening, but that he had himself been the means of communicating the disease. He was attending at the Meath Hospital, watching the progress of cholera, the very day on the night of which he was called on to attend this lady. On the fifth day after her confinement she was attacked with cholera, passed through the disease, and recovered ; on the sixth day of her illness the nurse-tender was attacked at half-past two in the morning, having gone to bed well on the previous night. This woman died. The other attendants in the house were very careful as to cleanliness. As to the nurse there was probably the *capacity* in her system, for the woman was a drunkard, and had been indulging largely in spirits when in attendance on the lady. The next case which came under his observation was that of a gentleman who lived in a large, well-situated country house ; he had been in Dublin during the day. He was attacked with cholera at night, passed through the disease well, and immediately on his convalescence his wife, who had been in close attendance on him, was also attacked with cholera. On the third occasion he was called in to see a servant in one of the best houses in Rathgar. There was nothing to account for her illness that he could find out, except the one fact, that she had been at a party at Donnybrook, where cholera was prevalent, and the night following she was in cholera. An infant was in bed with her when the first indications of disease appeared. A few hours after being removed the infant presented all the symptoms of Asiatic cholera, passed through it, and recovered. The woman died. With respect to the immunity of the police from the disease, he should say that, in his district, the police did not come into contact with the cholera patients, for they performed no sanitary duties. Two policemen in Crumlin were attacked, and attended by Dr. Davy. The first man recovered ; the second, who slept in the same barrack-room, and was in attendance on his comrade, received the disease, and, he regretted to say, succumbed. There was another man who acted as nurse-tender ; he never showed the least sign of illness.

Dr. Charles F. Moore said—As no other city district medical officer had addressed the society, he was desirous of mentioning the course cholera appeared to take in No. 3 dispensary district. 190 cases of cholera, and considerably more than 1,000 of diarrhea, came under the notice of the medical staff of that district. The first case of cholera was that of a labourer, who worked near the quays, where the cholera first appeared in this epidemic, but who resided in Bride-street : subsequent cases occurred in over-crowded and otherwise unwholesome cellars and other tenements. One of the worst outbreaks took place in a house

inhabited by the lowest class of prostitutes, and spread thence to the adjoining houses, which, after much trouble, the medical officers succeeded in getting closed. From three or four centres the epidemic radiated to the other parts of the district. In 1854 he was one of the physicians of the Finglas Cholera Hospital; the epidemic on that occasion commenced in a man just arrived from Belfast, who, after eating to excess and drinking much porter, was seized with the disease; he recovered; but a girl, living in the same very unwholesome house as this man, took the disease, and died of it, and at her wake several persons sickened, and thus the disease rapidly spread through the village, and many persons fleeing thence carried cholera to Kill of the Grange, the North Dublin Union Workhouse, and in other directions. His (Dr. Moore's) previous experience in Southampton, Egypt, the Mediterranean, &c., also had led him to consider that the disease spreads from person to person. The last Army Medical Report, that published in 1866, contained much evidence to show that the disease was communicated from those already sick, or in contact with the sick, to the healthy; the very striking instance of tne last epidemic in Gozo afforded evidence on this point. That island was remarkably secluded. The disease spread from a sailor who returned to his native island from Malta with the cholera upon him—first, to his own family and friends who had nursed him in the disease, and by these persons the illness was carried to the hospital in Rabbaro, the chief town of the island, whence it spread to the general population. Dr. Gordon's work on *Hygiene*, published in Calcutta in 1866, recognized the spreading of cholera by contagion in numerous instances where pilgrims passed near bodies of troops, &c. He would only add, in conclusion, that the experience of the past, as well as of previous epidemics in Malta, and what he himself had observed at home and abroad, led him to believe that human intercourse was the chief element in the spread of the disease.

Dr. Laing, Staff Surgeon-Major, said—A gentleman remarked on the previous night that he never heard of the epidemic influence of cholera travelling faster than man could do, but he (Dr. Laing) did not think it could travel nearly as fast. Any one who ever observed in the country the smoke from a fire, must have seen how every little inequality, every bush and tree stopped it, and prevented it from travelling quickly; and he was of opinion that rivers were quick channels for the conveyance of epidemic influences—not from their having " traffic " on them, and being, therefore, a means of human progress—but because the smooth surface of the river offered less impediment to the travelling of the epidemic influence along it. He was frequently in the swamps of America, and observed that the people who lived on hard ground in the middle of these swamps were perfectly free from attacks of intermittent fever, whereas those on the border portions of the clearing, where the original forests remained, were subject to severe and prolonged attacks of intermittent fever,

showing the appearance of it in their countenance, and an enlargement of the spleen.   He was in Prescott, on the banks of the St. Lawrence, when cholera came to Quebec—how or when he could not say.   It came, he believed, when the emigrants landed at Quebec, and they heard of it appearing at various towns on the St. Lawrence.   Every morning he went down to the wharf where the steamers touched, to hear anything about it that was to be learned.   A poor German emigrant woman, who had the disease, was landed at the wharf.   She was put into a shed, and the most effectual quarantine surrounded her, for no one went near her but her husband and himself (Dr. Laing), and he fed her and brought her the food with his own hands.   The disease broke out in Prescott, and spread round the town.   In one place there was a small two-storied house of wood.   It was surrounded by poplar trees, standing so closely and thickly together that they prevented the light getting into the windows.   The house was exposed to a breeze coming across part of a river which had been embanked for the purposes of the railway.   The breeze blew directly on the house, and in that house he attended eight cases of cholera, all of which died.   He attributed this to the cholera malaria coming up and across the river, and being collected and kept round the house by the trees.   He thought this showed that in most cases sanitary reform was the great thing to be attended to.   He might observe, in reference to a statement which had been made by one of the speakers that evening, that he had lived a good deal of his life in India, and had been attached to English and Irish regiments, and he never yet saw a British soldier refuse to attend his comrade in sickness.   If he held up his hand he would have a hundred volunteers for the duty.   If the medical officer, who said he found reluctance on the part of the soldiers to attend their comrades, belonged to the regiment, he and other officers must have shown a bad example.   It was the officers who were really answerable for the conduct of the men.

   The President said it now became his duty, as their chairman, to make a short summary of the proceedings of the last three nights.   In the first instance, they had reports from the various Dublin Hospitals that had opened their doors to receive cholera patients—the Meath, Hardwicke, Sir Patrick Dun's, and the Mater Misericordiæ Hospitals, and also one from the Mountjoy Prison.   In addition to these they had a most valuable abstract of a report of a recent epidemic at Utrecht, which they owed to the kindness of Dr. William Daniel Moore, and they had a report from the Bray Hospital by Dr. Darby.   Now the debate of the two last nights could hardly be considered to have been on those reports. It took a wider range, and he thought none of them could regret it, inasmuch as it had brought out a great store of interesting information from the army medical officers, for which they all felt deeply indebted. The results of the reports might be considered in a three-fold point of

view. First, as to what additions the experience of the late epidemic had made with reference to the pathology of the disease. Next, as to its treatment; and third, the question of its communicability or its mode of outbreak. Several dissections of cholera patients were recorded. Dissections had been made at the Meath, Hardwicke, Mater Misericordiæ, and Sir Patrick Dun's Hospitals. Nothing of importance had been realized, and this was what they should expect; for cholera, which, as they would all admit, was in the category of essential diseases, was not an affection that would show appreciable anatomical changes. Anatomy told them what it was not, not what it was; its information was negative, and there was one reason for this besides others—namely, the short course which the disease runs, so that there is not even time for the formation of those secondary organic affections which so commonly arise in essential diseases. Certain changes had been found, but they were quite incompetent to explain the nature of the disease; they were inconstant and unnecessary. The blood had been found thick and tarry, and the rigor mortis well marked. The rise of the temperature after death was a very curious circumstance that had been recorded in the Hardwicke and in the Mater Misericordiæ Hospitals. In this respect there was a curious analogy between cholera and sunstroke; the rise of temperature in the latter had been recorded by many military officers; it might rise three degrees beyond what it was at the time of death. He might be excused for alluding to another analogy, which would go for as much as it was worth. Last year, in the *Dublin Quarterly Journal*, there was a paper on sunstroke by a pupil of his own, Dr. Baxter, and he held that there was a very great analogy indeed between many of the phenomena of sunstroke and the phenomena of malignant or spasmodic cholera. Another remarkable fact had been observed—viz., that the extreme lividity of the body before death disappeared very much after death. Something very similar had been observed in cases of the disease called by some, " Purpura Maligna," and the " Black Death," where the large petechial or ecchymosed spots, almost black at the time of death, became red on exposure to the air. The right chamber of the heart was found full of blood, and a coagulum was formed in the pulmonary artery. Dr. Kennedy had alluded to puerile respiration arising from weakness of the heart as a symptom threatening death. This was very important; it showed a great analogy to other cases of weakness of the heart, for one of the most remarkable signs of fatty degeneration of the right side of the heart was the existence of loud puerile respiration, either constant or occurring in fits. The brain had been found generally healthy, and the spinal-marrow also. There was nothing else remarkable but a washed appearance of the intestines, and, in some instances, the bursting of Peyer's and Brunner's glands. The next thing to be observed was cadaveric twitchings. This was an extraordinary phenomenon. He was

acquainted some years ago with Staff-Surgon Marshall, an old Indian
officer, who stated that in the early outbreak of cholera they were all
anxious to determine the nature of the disease by post mortem examina-
tions; but he found it difficult to go on with the dissection, for the moment
the incision was made in the sternum, the body would spring up with
frightful gestures, as if galvanized, and it was very hard, he said, " to
make the young hands go on." As to treatment, no cure had been dis-
covered for cholera, and no cure, no specific was sought for. In this
respect cholera was not peculiar. There was no cure for any essential
disease. No man could venture to say that this or that treatment will
cure an essential fever. The physician guides it to recovery. He knows
the system is exposed to two dangers—debility and secondary disease—
and steering between these two rocks, he guides it until the time when
the clock strikes and the disease ends of itself, either in death or recovery.
So it is with cholera. In the reports from some of the hospitals, there
were columns apparently recording the results of special treatment, and
this was objectionable, for it led to misconception as to the practice of
the hospital. They read of so many cases treated by calomel, so many
by white of eggs, so many by stimulants, and so forth. The objection to
such a column as this was, that it might lead the public or medical men
at a distance to the erroneous impression that in the Dublin Hospitals
there had been any cases treated by this thing or that thing alone. The
great characteristic of Irish medicine, as Sir Dominic Corrigan had said,
was its eclectism; and when they inquired into the treatment of cholera
patients, they found that it had been decidedly eclectic, and no one mode
of treatment had been adopted in any number of cases. But with respect
to palliative treatment something might be said. It had been found in
some of our hospitals that an admirable method of relieving painful
spasms was by the inhalation of chloroform. This might be done with
perfect safety, and repeated again and again—not to such a degree as to
produce insensibility, but to act as an anesthetic, and procure the patient
relief. So also they found in the Meath Hospital great value, in the
collapse, from Sir D. Corrigan's button cautery along the spine. In cases
of suppression of urine, even when uremic symptoms had appeared with
complete suppression for forty-eight hours, cupping repeated again and
again, drawing a few ounces of blood, had restored the secretion of urine,
and been attended with success. The treatment by saline injections had
been tried by him, and with the usual result of apparent and almost in-
stantaneous relief; but in the course of a few hours purging came on
again, and the case was as bad as ever. In the Mater Misericordiæ and
the Meath Hospitals the treatment by calomel was tried, and with some
fortunate results. It was found that when bilious stools were produced,
the patient's chances of recovery were greatly increased. Now, as regards
the question of contagion, Dr. Kennedy spoke of negative evidence, by

which he meant the general opinion among gentlemen who practised in India, against the doctrine of contagion. It would be quite wrong to shut their ears to the evidence of these gentlemen. It was extremely important, however, on the other hand, that they should remember they were not to infer the phenomena of disease in one part of the world from those in another. The question of contagion in the North—in European countries—had some elements of difference from the question of contagion in tropical climates. The principal mortality in India occurred among the natives; and here we got another element—the comparative mortality of the disease in coloured men and in white men. It might be that the natives of the tropical climates, and the coloured races generally, were more liable to the exciting causes of cholera than the whites. He thought that extremely probable, and it also might be that contagion was apt to be more rife in the colder than in the warmer climates. It might be said, also, that the European constitution was less liable to contagion in India than in a more northern climate. So far as he could collect from Dr. Mackesy, who had had great experience, that was his opinion. Dr. Lyons, who advocated the non-contagion theory, had dwelt on the fact of the immunity of a large proportion of the staff of the Hardwicke Hospital. A similar circumstance was observed in the Mater Misericordiæ Hospital, where there was a large staff of physicians, and of Sisters of Mercy and hospital nurses, in constant attendance on patients, and yet there was not a single case of contagion. This showed, in a striking manner, that the disease, during the late epidemic, was not eminently contagious. But when they recollected the epidemic of 1849, and recalled to mind the terrible mortality among medical officers who were sent down to the country—five medical men, for instance, having been struck down in Sligo—they had a set-off against the immunity of Dublin during the late epidemic. The outbreak in Mountjoy Prison might be set against the contagion theory, and seemed to point to the spontaneous origin of cholera. But it was to be remembered that at the time of this outbreak there was a general epidemic prevalent, and they had to balance the chances of some communication from without, with those of the spontaneous generation of the disease within. It was remarkable that, coincident with the outbreak of malignant cholera in the prison, there was a great number of cases of choleraic diarrhea, and this furnished them with arguments for the philosophic view put forward by Dr. Darby—that when there was an epidemic of cholera, all those cases of diarrhea which were apt to run into cholera must be considered a species of cholera of a mild form. If this be so, and he had no doubt of it, it would greatly diminish the per centage of mortality, which, in place of being 50, would be only 20 or 30 per cent. The proofs of contagion in any epidemic mainly depend on a balance of probabilities, and the application of the doctrine of chances might be well made to clear up the

matter.   This was done in reference to fever by the late Dr. Whitley Stokes, who proposed certain problems to the Bishop of Cloyne, who was well skilled in the calculation of chances, as to the probabilities for and against the occurrence of ascertained events, assuming that the illness of one person did not promote that of another.   The society will find the results in Dr. Stokes' observations on contagion.   This mode of proceeding was eminently deserving of the attention of the society.   Dr. Stokes concluded by congratulating the society on the three meetings, and thought that great good would come of the discussion which had taken place.

On the motion of Sir D. Corrigan, seconded by Rev. Professor Haughton, a vote of thanks was passed to the military medical officers for the information which they had given to the meeting.

The meeting then separated.

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